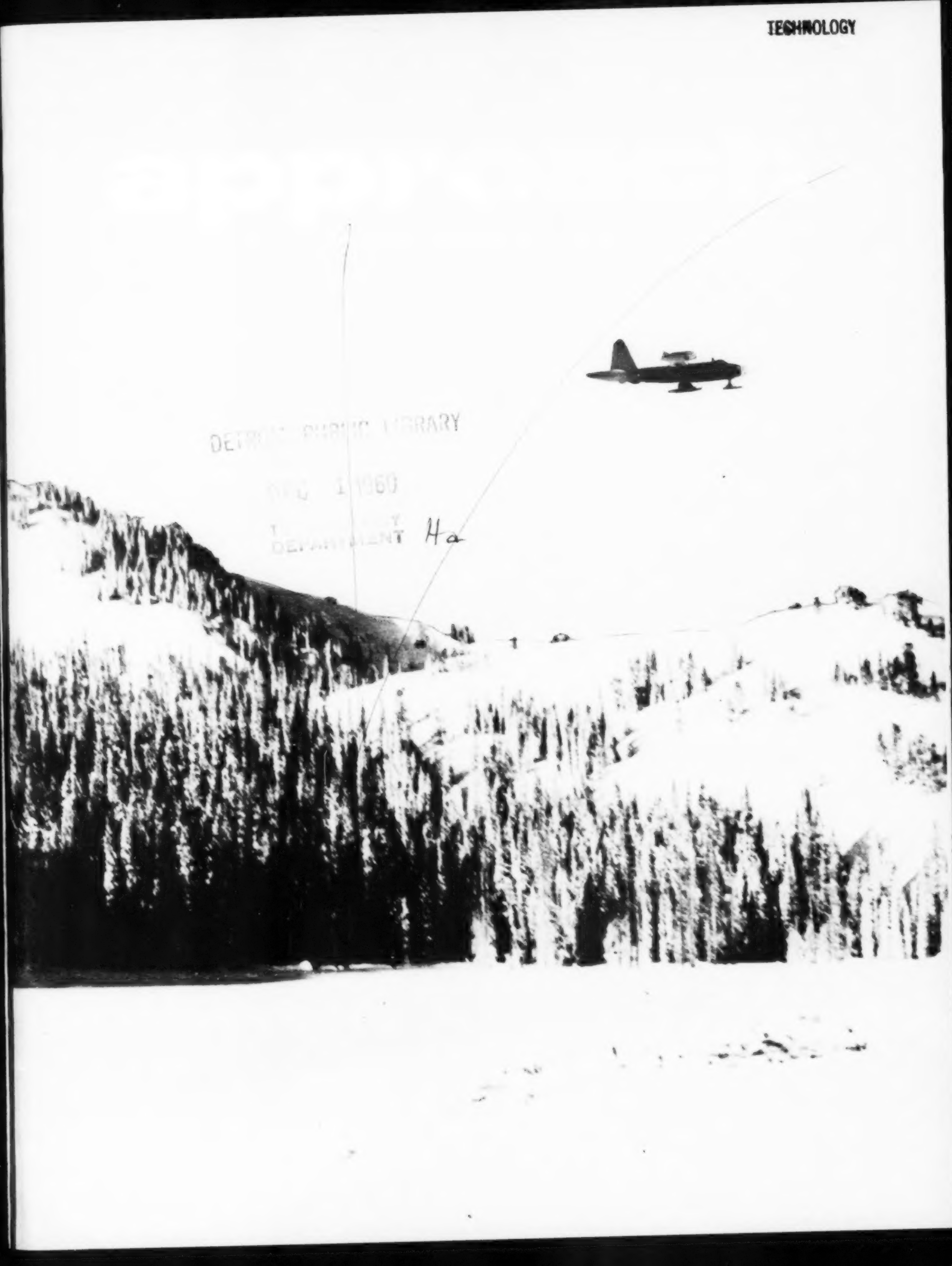

NEXT STEP

THE reduction in the accident rate within the Navy's air arm that we have enjoyed for the past few years has been the result of several factors. The Replacement Air Group has certainly helped, and there have not been any new type aircraft added to the fleet recently, and last, but we hope not least, is the fact that personnel are becoming more safety minded as the result of accident prevention measures. The Replacement Air Groups are here to stay, and with the possible exception of the WF and F4H we don't expect anything radically different in the way of airplanes, so the remaining variable is the accident prevention program to further reduce the loss of costly aircraft and lives.

In the past, accident prevention measures were derived primarily from the analysis of Aircraft Accident Reports (AARs). Problem areas were indicated, and remedial action could be initiated. With the reduction in accidents these areas are becoming less defined. Many of the accidents are not relatively isolated cases. The term "isolated" is used because there are still a few regular standbys that we will probably always be cursed with as long as we deal in people and retractable landing gears.

The next most logical step, it would seem, would be to try to reduce the Ground Accident, Incidents, and Flight Hazards.—*Com FAir San Diego*

Art and Photo Credit: Pages 10, 11, 12, 13—Douglas Aircraft Co.
Page 17—U.S. Coast Guard
Page 49—Carrier Sense

IN THIS ISSUE

Vol. 6 APPROACH No. 6

The Naval Aviation Safety Review

Published by U. S. Naval Aviation Safety Center
NAS, Norfolk 11, Va.
RADM William O. Burch, Jr.
Commander

Purpose and Policies: APPROACH is published monthly by the U.S. Naval Aviation Safety Center and is distributed to naval aeronautical organizations on the basis of 1 copy per 12 persons. It presents the most accurate information currently available on the subject of aviation accident prevention. Contents should not be construed as regulations, orders or directives. Material extracted from Aircraft Accident Reports (OpNavs 3750-1 and 3750-10), Medical Officer's Reports (OpNav 3750-8) and Anymouse (anonymous) Reports may not be construed as incriminating under Art. 31, UCMJ. Photos: Official Navy or as credited.

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LETTERS

Murphy Alert

Sir:

On F8U-2 aircraft the IFF and SIF control boxes are located adjacent to one another and they also have identical connectors, thereby setting up the possibility of a "Murphy." Though the cables are labeled it is easy enough for someone to cross-connect them if the labels are illegible or obscured. It has happened here and resulted in a yellow sheet squawk "IFF havano." Without going into a detailed investigation of cause and effect it is believed that should this equipment require a removal for access to other components it should be done only by personnel familiar with it. Correct reconnection of the plugs involved restored the correct function of the equipment.

SGT. MOUSE

Black Hole Lighting

Sir:

Your article on the Black Hole problem, brought to mind a Black Hole that is pretty famous among pilots on the East Coast.

This particular Black Hole is runway 5-23 at Quonset Point, Rhode Island. The runway is fairly short, but it is 500′ wide. To make matters worse it is covered with Black Top.

Many stories are told of this Hole, in BOQs and O-Clubs—some of them are funny and some are pretty serious. Each of these conversations seems to end with everyone giving an opinion as to what should be done to remedy the situation. The ideas range from cancelling night flying when 5-23 is the duty, to painting the whole thing white so it can be found after sundown.

One idea that is proposed the most often is that centerline lights be installed. Most pilots would then land off center, and in effect narrow the width of the runway from 500′ to 250′. The little bit of depth perception gained by this maneuver would be a great improvement over the present situation.

The use of reflecting materials sounds like a good idea for civilian fields and for SAC bases. Except for Navy transports and a few patrol aircraft, the Navy has very few, if any, carrier aircraft equipped with landing lights. *Who* are we trying to help? If it is the fleet pilot, we can skip the reflective materials, unless we want him to use his flashlight, while on final, as a landing light.

I believe that if the cost of repairing the aircraft that have overrun the Black Holes were totaled up, it would have more than paid for the installation of proper lighting facilities.

Until I acquire the eyes of an owl, or new lighting is installed, I'll keep shooting crosswind landings on the long runway, where I can, at least, get an idea of where I am going, and where I don't get vertigo on the rollout.

H. C. CURRAN, LTJG

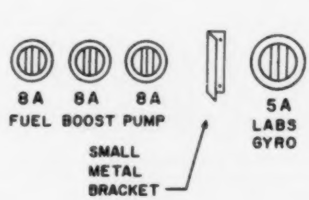
VAW-12

Fuse Pulling Tip

Sir:

Pulling the fuel boost fuses in the A4D is standard practice when power is to be applied to the aircraft for a long duration of time, and when the aircraft comes into check. This is to prevent damage to the fuel pump in case the fuel has been drained. It has been discovered that, when no light is available, a "feel" method has been used. Although this method is discouraged, it is still used. Three fuses are pulled, but one is the 5 amp Labs Gyro Fuse. This leaves one fuse on the boost pump resulting in an overload of the remaining winding, burning it out in 30 seconds!

It is recommended that a small metal bracket (see illustration) be installed between the Labs Gyro Fuse and the fuel boost fuses. It should be explained this is not to encourage the feel method, but to use the light method whenever possible.



A. E. LENTZ, AE1

VA-125

Maintenance Error Aid

Sir:

Refer Naval Aviation Safety Center study "Aircraft Accidents/Incidents Involving Maintenance and Servicing—1 Jan 1959 to 31 March 1960" distributed July 1960. This paper is an outstanding analysis of the maintenance factor in Naval Aircraft Accidents and presents cogent findings, conclusions and recommendations.

It is reemphasized that each commanding officer must give his closest personal repeat personal attention to the never-ceasing effort to eliminate maintenance errors. It is believed the referenced study will prove invaluable as an assist in his review of maintenance practices, procedures and standards.

E. J. PAWKA
Chief of Staff
(Acting)
Chief of Naval Air Training

NAS Pensacola, Florida

Radio Requires Warm-Up

Sir:

Unlike certain navigation and radar equipment the transmitter section of the UHF communications radio (ASQ-17) and also the ARC-27 common to Naval aircraft are *not* protected by automatic time delays to prevent high voltages from being applied before proper warm-up.

It was demonstrated to the exasperation of the writer that this does not seem to be common knowledge among some of our younger pilots. On completion of an installation (ground, not flying type) I had the experience of seeing such a check by a pilot. Immedi-

ately on turning on the set he keyed the mike rapidly several times "to see if it was warmed up yet." Naturally it never did warm up after that but further questioning disclosed that he always does just that prior to taxiing for a hop.

Pursuing the point further it developed that a considerable number of the junior pilots weren't aware that the equipment requires a reasonable warmup time before transmitting. (One minute according to the HSI.) If he was never told he can't be blamed but stressing the fact has reduced the UHF squawks in this squadron by a very considerable degree.

I believe the point should be stressed in a period of pilot training prior to assignment to an operating squadron. Meantime any method of getting the word around would improve the communications situation and also my achin' back because those durn packs sure are heavy!

SSgt ANYMOUSE

Driving Tip

Sir:

This squadron has experienced frequent accidents while vehicles were being moved in reverse. Many of these involved front fenders because the driver was so intent in watching to the rear. Perhaps automotive safety officers could be urged to indoctrinate vehicle operators in the importance of being alert for hazards to the side as well as to the rear of vehicles in reverse.

R. JEFFRIS

AEW One

Compass Swinging

Sir:

Your magazine and column are also interesting and useful to civil pilots. (Forecast altimeter settings for destination and alternate in the event of communications failure, frinstance.)

"Compass Know-How," APPROACH September, 1960, brought to mind a simple compass-swinging procedure.

Exact compass headings are known on all ILS runways (and ships?).

Setting the old D. G. to the exact heading at takeoff, I swing through and log the deviation on six points, then back along the runway to check the D. G. and swing through the remaining six points. It can be done in 30 minutes flight time off a small field and in smooth air. Happily, I know the exact runway headings at my home field.

It's simple but, of course, is a mission within itself and not readily included in an interceptor or other combat mission.

JACK HAWKS
(Old Silver Tip)

Yazoo City, Mississippi

Heads Up

Sir:

It is certainly true that with the advent of the canted deck carrier the hazards to personnel on the flight deck during landing operations were greatly reduced. The photo clearly shows that the flight deck still is a place where "Heads Up" must be a continual motto.

L. WAYNE SMITH
Safety Officer

Attack Squadron 55

Able Dog Angel?

Sir:

The articles "Bailout over Corsica" and "Good Show" in the July issue of APPROACH again illustrate that the problem of diverting jet aircraft at night from a carrier to a shore station is as pressing as ever. The lack of current accurate information, the unreliability of foreign air station nav aids, irregular operating hours, and the language barrier are severely complicating factors. Any pilot who has been diverted at night, generally either low on fuel or with an emergency—supplied with weather information obtained during the briefing two hours earlier, trying for a station 100 miles away, can fully appreciate the situation.

During carquals and night recoveries the use of an AD-5 or a section of ADs, airborne and positioned either over the bingo field or within UHF reception of the carrier can offer great assistance. The AD-5 could make contact with the shore station upon arrival and advise the shore station of the duration of flight operations, relay other information and determine the status of nav aids. The AD-5 monitoring the recovery frequency could immediately notify the shore station of any proposed action.

The RADCAP could assist the inbound aircraft by giving accurate airborne radar steers, short counts for the ARA-27, as well as report current weather based on *pilot* observations. The inbound aircraft could use the AD as a wingman in the case of instrument failure. *The AD could also be equipped with inflight refueling gear.* In the case of a ditching by the inbound aircraft, the AD is instantly available as a search aircraft.

There are no major disadvantages! The only inconvenience would lie in the delay in recovering this night "angel." An aircraft on station at sufficiently high altitude for good radio reception could utilize this altitude for a rapid return. If the shore station is adequate to accommodate diverted jet aircraft, it should be able to supply housing for one or two pilots for the night. The cost of per diem and the slight inconvenience caused by this procedure would be justified for *years* by the saving of one aircraft.

F. C. GROEHN, LT, USN

Vertigo Cure

Sir:

Just read your article "Common Senses" and as an eight-year pilot agree with the causes and cures but believe one of the best cures is training under conditions that most closely simulate actual instruments.

I know I'm prone to vertigo and when I get on actual instruments I usually at one time or another have to arrest it before the flight is over. The only other times I have gotten vertigo is when I'm under the "bag" with no outside vision at all.

At present, most single-seated aircraft with the seat down or some other form of hood gives the pilot too much outside perspective to actually simulate instrument conditions. Whether it be clouds, the contrast between the sky or the edge where the sky meets the ground, or just the brightness of the sun, if you can orient the nose and wing positions through these aids you can't really set the stage for a good case of vertigo.

My point is this: How can a pilot be expected to fight a good case of vertigo unless he has had a chance to train and prepare himself for it? Most simulated instrument flying in single-seated aircraft just establishes the procedures and co-

ordination for the pilot but it does not give him the effect of actual instruments. Give the pilots some good old 100 percent under-the-"bag" flying in their instrument syllabus and you'll see a most gratifying improvement in their ability to fight vertigo.

ANYMOUSE

● **Good points. We personally like the training described in "Muddle the Maze," USAF Flying Safety magazine (now Aero-Space Safety) for September 1959. If your ASO doesn't have a copy, write APPROACH for one. If you do, let us have your comments on both training proposals.**

GTC Starter Hazard

Sir:

An F8U recently received slight damage while starting with an improperly positioned tractor mounted GTC. Initially the tractor GTC had been properly parked however when the GTC failed to light off, the tractor was used to tow a pod mounted GTC into starting position. In so doing the tractor itself was stopped in such a position that its GTC exhaust was directly under the aircraft leading edge droop. Failure of the pod mounted GTC to function properly redirected efforts toward starting the tractor mounted GTC.

The precarious position of the tractor GTC was not noted before it was successfully lit off. Slight heat damage to the leading edge droop resulted.

The tractor mounted GTC has been designed in such a manner that vertical deflection of exhaust gases has eliminated any hazard to equipment or personnel in a horizontal plane. Since the annoying aspects of GTC exhaust have been in the tractor mounted model, the potential heat hazard has tended to become under emphasized. Maintenance personnel should be cautioned to maintain continuing vigilance on jet exhaust hazards whether they emanate from aircraft or auxiliary jet units.

ANYMOUSE

Accident Free

Sir:

Even though FASRONs were not eligible for the 1960 Safety Award, they played a very definite part in the excellent 1960 safety record.

FASRON 3 compiled nearly 100 carrier landings and over 15,000 accident-free hours by over 500 aviators during Fiscal Year '60.

Recognition of the efforts of the officers and men who contributed to this record is warranted.

J. H. BRANTLEY
Acting Commanding Officer
VRC-40

Readyroom skull practice is used to develop skill in handling inflight emergencies by CNO Safety Award-winning VA-81 (jet). Here the aviation safety officer (left) grills his XO (standing) to the delight of squadron pilots.

Still Uncertain

Sir:

Read the March 1960 issue of APPROACH ("Survivor Sighted," page 19) and feel greatly disheartened at sacrificing standardization of the whole Naval Air arm for the benefit of one locale such as the Corpus Christi complex. I commend Headmouse for his rather *uncertain* support for the normal, standard clean orbit of a downed aviator.

If this new idea is going to be forced down the throats of some, then it should be forwarded via proper channels and properly standardized. Anything else is confusing both to those who may have to fly the orbiting aircraft and also the poor, soggy soul in the drink who cannot be certain whether the aircraft circling belongs to a squadron from Corpus or an SAR team from a ship or other shore establishment.

My vote, and I'm sure it is well supported in numbers, is for a return of the whole Navy to that which is and always has been—STANDARD.

LIEUTENANT

● **Many agree with you on the old, clean orbit, though of course local conditions may dictate other variations.**

Caleb Flerk Expert

Sir:

Your magazine has a wide and enthusiastic following. Your readers even read the small print! Such as page 26 of your August 1960 number. At the bottom of the first column of your feature "Whether Man," you refer to the old classic about Caleb and his trouble of a serious nature. You even offer a copy. I read the story once, and would very much like a copy for the Royal Air Force College.

I enjoyed (and learnt a lot from) your very professional article on ditching. We land lubbers are told to avoid ditching (eject preferably) as the ditching characteristics of most (land based) jets are not well known. But the time might well come; then a little knowledge is a useful thing!

R. P. MC CORMACK
Flight LT
RAF College

BORN TO LOSE!

COOLSTONE had just taken off on a test flight in an F-101B. While climbing out, he had experienced some lateral control problems. He held at 35,000, and as the aircraft slowed down after the climb, he experienced an uncontrollable roll tendency to the left at around 270 knots. Even with full right aileron below 270 knots he couldn't hold the aircraft level. He knew he was in serious trouble.

"Hello, McCoy Tower, McCoy Tower. This is Coolstone One, over." There was a certain amount of urgency in Coolstone's tones.

"Roger, Coolstone. This is McCoy. Go ahead."

"This is Coolstone. I'm having control difficulties with this aircraft. Please call our squadron Ops and ask the CO to get on the radio. I'll pick him up on the tactical frequency."

As Coolstone waited, he began to weigh all the factors in this situation. He was pretty sure he couldn't land the bird without an accident in its present condition, but he certainly didn't want to bail out. What do you suppose the Accident Board would say? If he bailed out, he probably wouldn't be open to much criticism, but it seemed such a shame to leave a bird in this kind of shape. If he tried to land and goofed in the slightest, well he'd seen the results before—a transfer to a GCI station.

Then on the radio he heard, "Hello, Coolstone One. This is Surefire Ops. Do you have a problem?"

Coolstone recognized the voice of his commander. "Surefire from Coolstone. You bet your boots I have trouble. I can't control this bird under 270 knots. Seems as if the aileron control craps out, or something. I let it go to 260 just a few minutes ago, and got into a roll before I could get the speed up enough to stop it. What do you recommend?"

"How much fuel do you have, Coolstone?"

"Well, if I hold it here at 270 to 275, I'd say I have about one plus 45."

"Roger, boy. Stand by."

At this point a thought began to take form in Coolstone's mind—an insidious, sneaky, dirty thought that only could gain birth in a devious mind. I know what I'll do, he thought. I'll give the accident board my problem. I'll do exactly what they recommend, and no matter what happens, it won't be my accident. Let the experts investigate this one before it happens. For once they can do their famous second-guessing on the first go.

"Hello, Surefire. This is Coolstone One. Over."

"Roger, Coolstone. This is Surefire." It was the commander still.

"Roger, Skipper. I've got a problem here. I don't know whether to bail out or try to land this thing. In any case, I'm sure I am going to have an accident of some type. I can't control the bank under 270, and I can't stop it with full right aileron or rudder. I've turned off the autopilot and I've pulled the circuit breaker, so that shouldn't be the trouble. What I was thinking—how about getting the Accident Board members together there in the squadron, and give me the expert advice before I have the accident? I'll abide by their judgment on whether to bail out or try to land this thing and have my accident then. I'm pretty sure I'm going to have one."

"Well, now, Coolstone," said the CO. "This is unusual, indeed. Actually, it is up to you—the pilot's discretion, and all that type of thing. It's really your deal."

"Yes, sir, I know it is my problem and at my discretion, but if my discretion isn't the Board's discretion, I'll get tagged with a pilot error acci-

dent, and you know what that means. Unless you'd care to advise me what to do yourself?"

"No, no, er, ah, I wouldn't care to do that right now, and you do have a point. I tell you what I'll do. I'll get the Board down here as quickly as possible."

The CO called the tower and activated the crash circuit, as there is nothing that will scare up an Accident Board quicker than the activation of the crash circuit. Therefore, 15 minutes later an impressive-looking puffing group was standing around the squadron radio. This group was composed of the Board president, the accident investigator, the flight safety officer, the doc, the tech reps for the aircraft and engine, the weather man, the group maintenance officer, and, of course, the squadron operations officer, and the CO.

The Board president took the microphone. "Hello, Coolstone One. This is the Accident Board president. I understand you are having a little problem. How much fuel have you remaining?"

"Yes, I might say I have a little problem. I just can't control this bird under 270 knots. I have about one plus thirty remaining. I could use some advice. How about holding a board and right now, based on the information we both have available to us, advise me what to do? Shall I get out, or shall I try landing? I figure I have an accident cinched both ways. I might save part of the bird at least if I landed."

"Mmm, ah, yes. Let's see," said the Board president. He looked inquiringly at the group surrounding him, and surprisingly enough, none were anxious to talk. At normal Accident Board meetings, the president couldn't keep them quiet. They all knew exactly what the pilot should have done and didn't, but now they were strangely silent.

"How about you?" The president looked at the aircraft tech rep. "What would you suggest under the circumstances?"

"Well, let's see," said the rep. "I really should have my HMI to look at, so I can check out the circuitry. I would hesitate to say without my books. I wouldn't be a bit surprised if this wasn't an engine problem anyhow." He looked slyly at the engine rep.

"Oh, come off of it," said the engine rep. "You airframe people stay up nights trying to hang us. Now you can't get out of this one."

"Well," said the Board president. "I'm still waiting. What do you think? Should he come in and land, or should he bail out?"

"Well," said the aircraft rep, "offhand, I'd say he is probably exaggerating his problem somewhat and undoubtedly could make a safe landing. Our equipment has double-safe circuits, with failsafe devices provided to you only by my company." He broke off as the president handed him the mike.

"You tell the pilot all this information and whether you think he should land or not."

"Oh, no, no, no," said the tech rep, handling the mike like it was smallpox.

"No, I didn't say for him to land. I just said—"

"Well, to sum it up," said the president. "What you said was that you don't know what he should do."

"Well, now, I didn't say that either," said the rep, "but look, I'm just an advisor, I'm not really a member of this Board."

"O.K., O.K.," said the president. Looking around once again, he said, "Who's got something to say? How about you, Wag?"

"Yeah, yeah," said the irrepressible weather prophet. "I'd say about 5000 broken and 15 miles, just as I forecasted."

"Sure, you would, Wag. How about it, Doc? What do you think?"

The Doc looked thoughtful for a moment, then said, "Is he hypoxic? And ask him if he had breakfast. You might even ask him if he's having any personal problems."

"No, Doc. He's not hypoxic, and I doubt if personal problems or the lack of breakfast have anything to do with the aileron."

"Well," said the Doc. "Obviously I can't contribute."

At this point the maintenance officer spoke up. "I've been thinking," he said. "Maybe if he came down to a lower altitude and tried it there, the temperature difference might improve the operation of the aileron control. Now, I don't mean that this particular problem right here is caused by temperature, but on the other hand, wide temperature changes can sometimes cause even the best-maintained equipment to operate strangely."

The Board president recognized this pitch from the last accident board.

"Here's the mike," said the Board president. "Go to it."

"Hello, Coolstone, this is the maintenance officer. I wonder if you have considered coming down to, say, 5000 feet or so and seeing if the temperature change will solve your problem. It's just possible it might clear it up."

"Roger," said Coolstone. "I understand that you're recommending that I come down to 5000 feet."

He was interrupted by the maintenance officer. "I didn't say I recommended that you do that. I just wondered if you had thought of it."

"Yes," said Coolstone. "I thought about that and lots of other things, too. Now just what is it that you recommend? Shall I come down and land, or shall I stay up and bail out, or is there something else you'd like me to try?"

"Well, now, let's see. Mmm . . . I recommend . . . no . . . stand by." The maintenance officer wordlessly handed the microphone back to the Board president.

The Board president addressed the Flight Safety Officer. "What do you say? What should he do?"

"Well," said the Flight Safety type. "He obviously is experiencing a malfunction. I'll be sure and put it in my next Safety Officer's Report. But as to what he should do right now, it looks like it's a decision he'll have to make for himself. But I sure would like to get the bird back so we can find out what's wrong."

"You tell him that," said the Board president, and the Safety Officer found himself holding the microphone.

"Hello, Coolstone, this is the Flight Safety Officer. Do you read me?"

"Roger, boy," said the Cold Rock. "What do you recommend? Do you have something?"

"Well," said the Flight Safety Officer. "I recommend that you do whatever you think is right. It's up to you, the way I look at it."

"Wait a minute," said Coolstone. "I want to do the right thing as you people see it, not as I see it. Now it would appear that you and the rest of the experts there, standing with your both feet firm on the ground, could do a little first-guessing for me, and give me some suggestions.

"What do you recommend I do? I'll follow through."

"Stand by," said the Safety Officer.

"Let's call the division," some one suggested.

"Excellent idea," said the Board president.

A priority rush, rush call was placed. After a second or so, the division Safety Officer was on the line.

"This is the Accident Board president here at McCoy. We've got a problem," and he went on to explain the situation in full to the Safety Officer at the division. Then he said, "What do you recommend that Coolstone should do here? He is insisting that we give him some assistance in the form of recommended action. Would you suggest that he land, or should he bail out?"

"Stand by one," said the division Safety Officer. After a long delay, while the president could hear much loud discussion in the background, the Safety Officer came back on the line. Then he said, "Being that far away from the problem, we don't have any firm recommendations at this time. However, we think you'd better check with Air Defense Command Headquarters."

"Roger," said the president. "That sounds real good."

The lines to ADC were promptly cleared by the emergency call. Soon the Director of Flight Safety at ADC was on the phone. "This is the Director of Flight Safety. Can I help you?" he said.

"You certainly can," said the Board president, and then proceeded to explain the whole situation, ending with the fact that Coolstone only had about 30 minutes of fuel remaining, and asking him for recommendations.

"Well, let's see," said the Director of ADC Flight Safety, "Ah . . . mmm. I sure wish I had this on paper; I could staff it then. But let's see. I would definitely recommend that the pilot . . . Oooops, there goes the blue phone. The general is calling. I'll have to hang up, but be sure and let me know how it comes out."

The Board president had the problem back in his lap once again. At this time Coolstone came back on the radio.

"Come off of it, you guys. I'm going to have to come in now, if you recommend that I land. Otherwise, I'll fly over the field and eject. I'm at the end of my fuel. I've tried flying the airplane with gear flaps and speed brakes down, but I still can't hold it below 270. What do you recommend? I have to have it right now."

Sweat broke out on each and every board member's forehead. The moment of truth had arrived. The president stared thoughtfully. The rest of the members shuffled their feet and cleared their throats, but said nothing. Then the Board president had an idea.

He called the squadron CO and the ops officer over. "Look," he said. "Let's tell him to come on in, and if he can't keep it in control all the way through to the final, have him eject. Is that O.K.?"

"O.K." They all nodded in agreement. "It's a real good idea," said the maintenance officer. "The temperature might help, too."

"O.K., Coolstone," said the Board president with a sigh. "Here's what we recommend. Come on in. Keep your speed no higher than necessary, make a high pattern and a long, long final. If you have trouble anywhere in the pattern, eject before you get below 1000 feet."

"Roger," said Coolstone. "I'll give it a go. Thanks a lot."

He brought the airplane down, entered a high downwind, put out his gear flaps and speed brakes, and kept his speed above 270—right on 275 as a matter of fact. He turned a long, long base, and, trying to keep his altitude, allowed the speed to bleed off. The bird, already in a left bank, increased its angle of bank uncontrollably. Coolstone frantically brought in both afterburners, and he was ready to eject. It looked like he'd had it. Then the speed came up slowly, and he regained aileron control once again.

There were 10 separate sighs of relief—9 board

members' and Coolstone's.

At this point all the board members were yelling instructions at the president.

"Tell him to eject," said one. "Tell him to turn without banking," another said. "Tell him to hold it straight up," said another. "Make a longer final." "No, a shorter one."

Coolstone heard none of this. The president of the Board remained silent.

On final now, Coolstone held a good, solid 275, with the stick full right. He even had some rudder in to hold the wings level. This caused a slight skid but Coolstone was planning on releasing it as soon as he touched down. In fact, he had all of the steps firmly in mind. The runway was 9200, including overrun. It had a barrier. He figured he'd pull the chute just as soon as he landed, use aerodynamic braking until 110 or so, and then lower the nose and really get on the binders. With luck the barrier would catch him with little or no damage. If he missed the barrier, he'd be going off the end slowly enough so that there would really be no serious damage to the aircraft.

Over the threshold now, he let the bird down, and he forced it on the runway. He popped his chute and felt it catch, and then was horrified to feel it release again. He saw his airspeed was about 250. He held the nose up as far as he could while getting the main gear off. He felt the aerodynamic braking take over, then he saw the end of the runway coming up at a remarkable pace. At 115 or so he placed the nose gear on the runway and really clamped on the binders. The antiskid brakes went into action.

Coolstone could see he wasn't going to get stopped. At the last moment he released the brakes and steered for the center of the barrier, then just held on. He glanced at his airspeed and saw he was doing 60 knots. The barrier did not catch him. He went off into the boondocks and, just before he stopped, hit a small ditch which collapsed the nose gear. That was all. The bird stopped.

Whoops, he thought. I made it, and a pretty good job, even if I do say so myself.

He got out of the airplane and surveyed the damage. Sure enough, all that was really dinged was the nose gear itself.

A week later Coolstone attended the Accident Board for his accident. The president reassured him that it was merely a formality, just to satisfy the records. After Coolstone was sworn in and had sat down, the president said, "Now we have a few questions, just for the record. For instance, what speed did you hold on final?"

"About 275," said Coolstone. "I couldn't hold the airplane level at any less. I tested it several times and you saw what happened when I turned base."

"I'll say we did," said the president. "It took a good bit of flying to recover from that. When did you deploy the chute?"

"Well, right at touchdown, of course," said Coolstone, "But it came right off, because I was going too fast. For just a bit I thought it would hold."

At this point the maintenance officer spoke up. "Just for the record, here's what we found wrong with your control. It was maintenance error, and there was nothing that you could have done to correct this problem in the air. And, just for the record, the chute did not malfunction. It was packed correctly and deployed correctly, but, on account of the high speed, it sheared from the aircraft. That's just for the record," he repeated.

The Board president took over once again. "I think that's all we'll need, Coolstone. Thank you very much. It looks like you did a real good job."

Coolstone left the room, and decided to wait outside. He felt good. Everyone said he did a good job, and they had found the failure. But he wanted to hear the words—the actual Board findings—from the horse's mouth. About an hour later he was still waiting. He wasn't particularly concerned, for he knew of the many details and paperwork involved in an aircraft accident report.

Finally the door opened and the Board president led the group out.

Coolstone rose to greet them, all smiles. "Well," he said, jokingly. "What's the verdict?" Never doubting for a moment what he would hear.

"Sit down, Coolstone," said the Board president, placing a fatherly arm around Coolstone's shoulders. "Here's what we found—pilot error."

"Pilot error!" shouted Coolstone. "I did just what you said. You knew I was going to have some kind of an accident. I told you I would. You recommended that I land. I did just what you told me to do."

"Yes," said the Board president, "but how could we know you would deploy the chute at 270. The maximum drag chute deployment speed, we find in looking at the dash one is 215. Also, by our figures—we have just spent an hour with the charts—if you had waited until you did have 215, it would only have taken about 5100 feet of runway to get stopped."

"But . . . but . . . but." said Coolstone.

"Don't worry," said the Board president. "This is just a fact-finding committee. No disciplinary action will be taken."

Coolstone started to protest, but he knew better. He knew it would be no use. He walked dejectedly out of the room, and said to himself, "Oh, well, maybe I'll like GCI."—*ADC Interceptor, April 1960*

YOU WROTE THE CAPTION!

The readers of APPROACH have characterized themselves as a most sympathetic and compassionate group. They have hastened to express their concern for our pitiable friend languishing in the isolation of his tethered raft.

Here are some of the captions we have received so far:

"Please come up, Sir. Those AAR Boards can't be that bad."—*Lt N. A. Nichol, VP-874*

"Who would want to sabotage this?"—*J. J. Hughes, AMS2, VF-41*

"I wonder if I can claim salvage rights."—*A. E. Lentz, AE1, VA-125*

"This thing sure tows kinda hard."—

"And the fish aren't biting either."—

"Damn the torpedoes, full speed ahead!"—*CDR F. J. Johnston and CDR D. C. Down, NAS Willow Grove, Pa.*

"So my deodorant failed me."—

"Stop sulking. They're sending your plastic ducks out on the next launch."—

—"Command at sea."—*LCDR A. J. Weil, Staff, ComCarDiv TWO*

"This is one way to get sea duty—stand your guard in the middle of the drink."—*A. M. Germain, YN3, Basic Staff, NAS, Pensacola, Fla.*

"I'd like to swap this M-1 for a spinning rod."—

"Here comes the OOD. I can see his snorkel."—*T. A. Peltz, FAETUPac Det One, NAS Alameda, Cal.*

"You should have seen the one that got the wave-off!"—

"That clock's got to be down there somewhere."—

"I wish the Mary Ann would get here. This thing's getting heavy."—

"The boys at the barracks are never gonna believe this one."—*LCDR R. M. Gerdes, VF-879, NAS, Oakland, Cal.*

I told 'em those FJ's wouldn't float!

Check that sub at 5 o'clock.

That must have been some happy hour that joker was at last night.

Aircraft in the groove! Surface and identify yourself! Over!

No approach is so bad it can't be salvaged.

If you ease enough gun he has to cut you.

This is 201, repeat that altimeter setting.

Say again all after mayday.

Moffett tower, 201, long final.

—from the Readyroom of VA-112
by Safety Officer J. L. Rupp

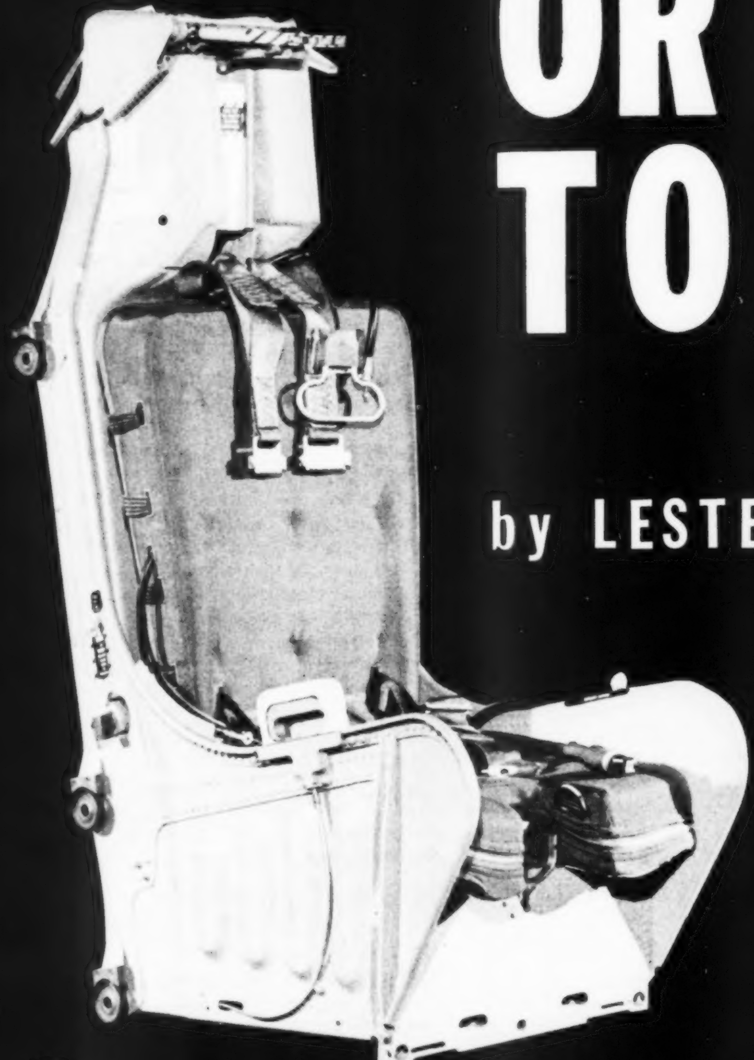
And almost everyone remembered to include a safety hint or slogan with the captions. Here is one good example:

"A screwdriver can change from a constructive to a destructive device when left in your back pocket."—*H. R. Carmack, AMS2, VS-27*

Thanks to all who took the time to send in their captions and safety ideas.—Ed.

TO GO OR NOT TO GO

by LESTER CARLYLE



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EJECT or crash-land! These are the two alternatives facing the pilot in a low-level emergency. If ejection is the choice, he gambles that he is high enough for his escape system to work. Crash landing is—well, not really a choice, but merely a last resort.

Some low-level fatalities may be avoided by prompt ejection—a couple of seconds can make the difference. On the other hand, all the promptness in the world won't help if the altitude is too low for the escape system to function. Although there is no sure way of knowing how many pilots might have been able to eject but decided not to, it is common knowledge that the number is appreciable. The foregoing all adds up to the unpleasant fact that low-level escape has been a critical flight safety problem.

A significant improvement in low-level escape capability is now provided by the Douglas Escapac System. Key factors in achieving this performance are the Navy-developed RAPEC rocket for height and the forceful separation of seat and pilot for time-saving. This fully-automatic rocket catapult ejection seat system has extended the lower end of the A4D escape envelope to ground level at 90 knots. It has been qualified for service use by BuWeps and is presently being installed in all new A4D aircraft and retrofitted in all A4Ds delivered to the fleet.

Continued

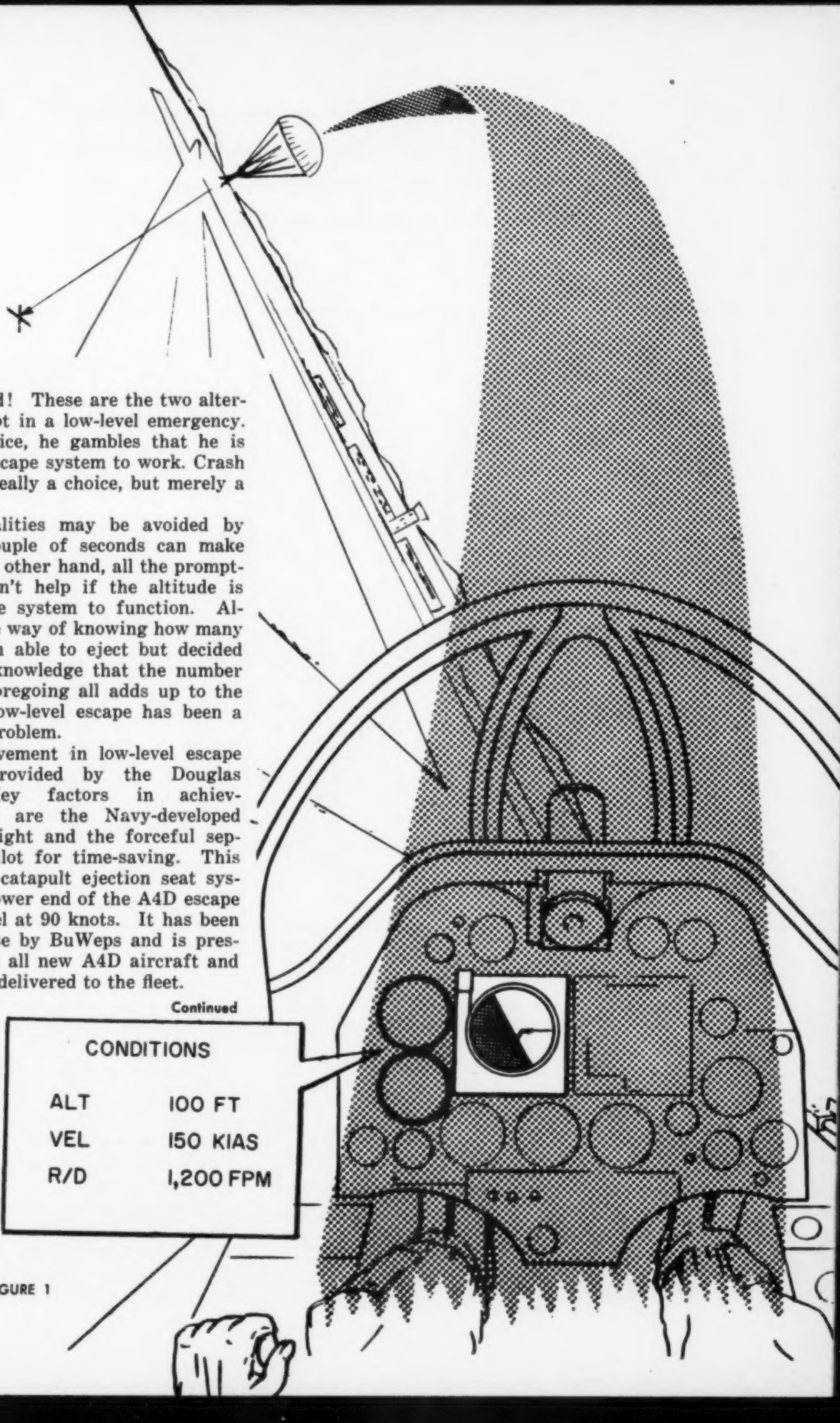

FIGURE 1

Continued

An appreciable number of pilots might have been able to eject but decided not to. With the newer systems ejection is preferable in all but the most unusual cases.

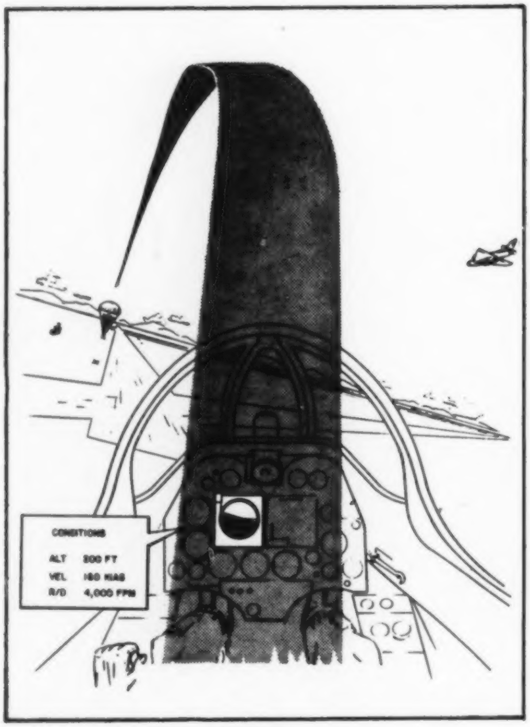

FIGURE 2

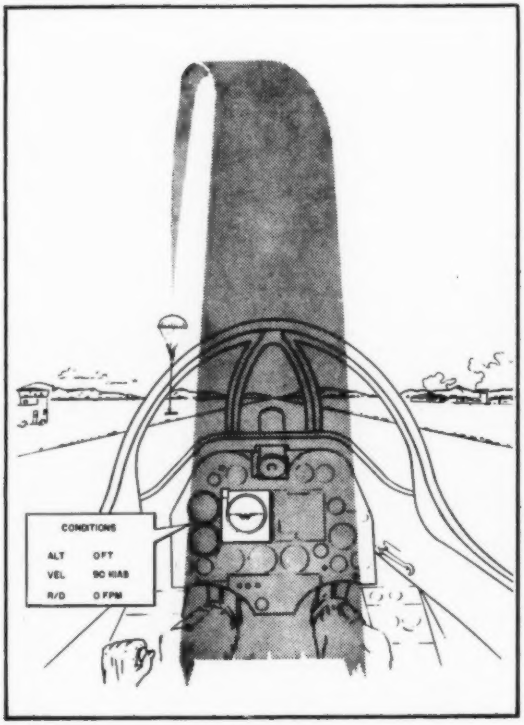

FIGURE 3

At 90 knots on the deck, a 200-pound pilot attains a peak trajectory height of about 200 feet and the parachute is opened fully at least 90 feet above the terrain. At higher speeds these heights are correspondingly lower but even at 60 knots on the deck, successful escape is realized. The pilot experiences an ejection force of about 12G from the rocket catapult applied at 250G per second, well within human tolerance limits.

When the pilot pulls either the face curtain handle or the secondary firing control handle, this automatic sequence follows:

1) Canopy jettisons
2) Canopy-seat interlock pulls out
3) Rocket fires
4) Communication and ship's oxygen disconnect
5) Emergency oxygen supply activates
6) In ¾ second, pilot's harness and seat firing controls disconnect and separation bladders inflate
7) Seat and pilot separate
8) Parachute actuator arms
9) In 2 seconds, parachute deploys

The sequence is the same at all speeds. Sled tests at speeds up to 600 knots have shown safe opening of the 28-foot parachute with the ¾- and 2-second time delays in the system.

Some typical low-level ejection conditions are shown from a pilot's-eye view in the accompany-

ing sketches. The airstrip locale in Figures 1, 2, and 3 was chosen for convenient attitude and distance reference. Figure 4 illustrates a not uncommon carrier emergency. More details on various ejection circumstances are given in the A4D Flight Manual.

The old jigsaw puzzle of speed, altitude, pitch, roll, and sink rate still concerns the pilot faced with an ejection. However, by furnishing the ability to escape successfully at low speed on the deck, the Douglas Escapac System virtually eliminates the necessity for hazardous crash landings. With this system, ejection is preferable in all but the most unusual cases. ●

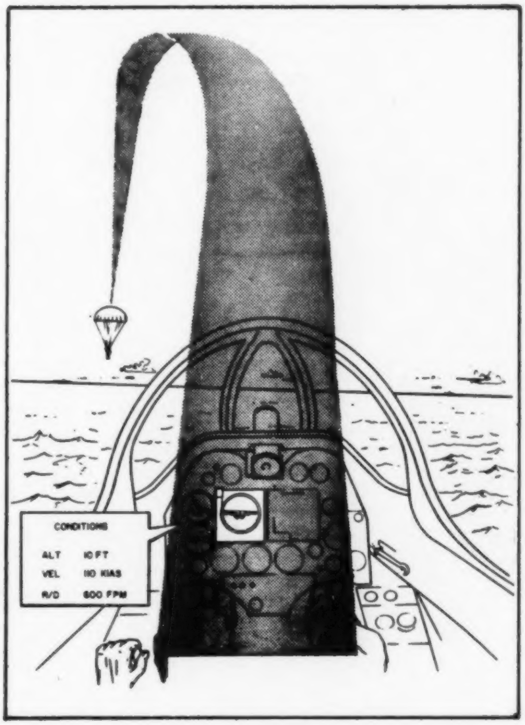

FIGURE 4

Lester Carlyle is presently Human Factors Lead Engineer in the Bio-Mechanical Design Section of Douglas El Segundo. Since 1956 he has been active in the research and development program in the areas of pilot efficiency, safety, escape and survival. His experience also includes military service as a USAF Research and Development Staff Officer during Korea and as a radio operator in the 4th Marine Division during WWII. He received a degree in aeronautical engineering from New York University in 1949.

WHAT ARE YOUR ODDS?

When you first get an indication that you may need assistance—make your initial emergency call and switch to emergency IFF

by LCDR Harry S. Johns

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DO YOU know how to improve your chances if you should successfully leave an aircraft in an unconventional manner?

We hear much today about professionalism in airmanship. If you consider yourself a professional in the game of flying you must then consider yourself proficient at airmanship. But have you thought about proficiency in survivorship? Getting out of an aircraft successfully does not necessarily make you a survivor.

It is not the intention here to dwell on survival as we know it generally, and we will not be discussing survival equipment, such as anti-exposure suits, at any length. Specifically, we will be talking about the search and rescue aspects of your survival.

How many times have you heard the expression "The operation was a success but the patient died"? What are your odds after you survive the initial crash, ditching, bailout or ejection? There are many factors which you as the pilot can control that will increase your chances of becoming a live survivor.

Let us suppose your operation was a success and you got out of the aircraft without incident. You have your survival equipment and know what to do with it. Now, what are your chances of being picked up? Your chances are very good if:

(1) you broadcasted a "MAYDAY" and switched your IFF/SIF to EMERGENCY; or

(2) if you had a wingman and he knew what to do; or

(3) you were spotted by a ship, person on the beach, or

(4) landed near a well-populated area.

But, on the other hand, let's suppose you are inbound to the beach from a carrier 140 miles off the coast. You left the ship with a wingman, but he had to

SAR forces can't help you unless they know you're in trouble.

return due to engine difficulty. So now you are making like Lindberg when the fire warning light comes on and you get a big rumble from the mill. A turn accompanied by a look over your shoulder confirms your worst expectation, and just as you reach for the IFF switch (providing you are the cool, calculating type!) you lose elevator control coincidentally with a face full of smoke. And you decide (and about time) to go! What are your odds now?

We now have to apply some of the factors over which you have no control. When you departed the ship a flight plan was sent to the beach announcing your expected arrival time—first of all, this always arrives after you have called the tower, explained who you are, what you are, where you came from, and how come "we ain't got no flight plan on you"; that is, if it is the normal flight.

However, let's assume your flight plan has been received and it has been noted that you have not arrived, and you are 30 minutes overdue or out of fuel, whichever is first. The Operations Duty Officer calls the Rescue Coordination Center and reports you as overdue. The Rescue Coordination Center (Coast Guard in the Maritime SAR Region) asks that a ramp check be conducted at your intended destination and at the same time initiates a call to other airfields in the radius of your flight capabilities and requests they conduct ramp checks. FAA is requested to initiate an ALNOT (alert notice) to its stations and in addition a message is sent and a radio call made through the nearest Navy facility having two-way voice communications to your ship to ascertain if you have actually left the ship or if for some reason you have returned aboard.

While awaiting the results of the ramp checks, ALNOTS, and departure confirmation, the local SAR net is alerted and if you still have fuel, Towers and RATCCs are asked to broadcast on Guard and radar sites are asked to intensify their surveillance of aircraft targets for emergency squawks and left or right triangular patterns. Search aircraft from the nearest SAR facilities are alerted and a search plan is drawn up.

Once it is ascertained that you have not arrived or returned anywhere, the search plan is initiated and an all-ships broadcast sent. A plot of nearby merchant vessels is requested from Commander, Eastern Area, Coast Guard (in the Atlantic Maritime Region), this plot being kept current through the AMVER Program (Atlantic Merchant Vessel Reporting System) operated by the U. S. Coast Guard, plots ship positions from data voluntarily sent by a large number of merchant vessels to provide rapidly at any time a list of vessels currently located in a given area. Such lists are called "Surface Pictures." This information is important to ship and aircraft which need help and to those who coordinate search and rescue. In the Pacific Maritime Region a similar system is in operation in which the Coast Guard receives and compiles ship positions along the track of the established air route between the United States and Hawaii (again the merchant vessel participation is voluntary).

Now you are being searched for, first along the track of your planned flight and then over an expanded area. This can take days and may involve numerous aircraft and surface vessels. The search is continued until you are found or until there is no reasonable possibility that you still survive.

A very grim picture has intentionally been painted to emphasize how important your part is in alerting SAR and what is now available and what is being developed to assist you, the pilot, in the event you become a SAR incident.

You can increase your odds of being a live survivor if you know and use proper emergency procedures. A call to any station or other aircraft, prefixed with "MAYDAY," will get their attention; give your aircraft identification and your best estimated position. *These items are essential.* The rest of the emergency information contained in the last two pages of the Enroute Supplement are desirable, but if you have to go immediately, at

the very least get the essential information out:

- MAYDAY
- Aircraft Identification
- Best estimated position

And do not forget IFF/SIF on EMERGENCY. This definitely supplements a "MAYDAY" transmission and in case of radio failure *is your only method of alerting SAR immediately!*

In regard to IFF/SIF, a device is being developed which automatically triggers the EMERGENCY IFF/SIF when the ejection seat is fired, thus transmitting an emergency squawk to radar sites without the necessity of the pilot flipping the switch.

The best answer for the question "When do I make the initial emergency call or IFF squawk?" is: *WHEN YOU FIRST GET AN INDICATION THAT YOU MAY NEED ASSISTANCE!* Keep in mind that if your emergency rights itself, all it takes to cancel the request for assistance is another call, stating that you no longer need assistance. Injured pride even if it materializes can be easily repaired at Friday happy hour—physical injuries usually do not respond to the same martini treatment.

In the Norfolk area, the Norfolk DF-Radar is the SAR communications net that will process your emergency call (13 military and FAA Centers plus the communications facilities of each of these activities). Should your emergency take place along the coast (either over land or out to sea) of Maryland, Virginia or North Carolina, the Rescue Coordination Center (Norfolk Search), located in the Fifth Coast Guard District Office, will be the agency responsible for coordinating the SAR action. Each Coast Guard District and/or Air Force Rescue Coordination Center has similar capabilities, but none presently has a DF-Radar Net, although one is presently being organized in the coastal area of Connecticut, New York, New Jersey and Delaware under the Third Coast Guard District Rescue Coordination Center (New York Search). The DF-Radar Net concept provides immediate relay of emergency information, immediate plotting of aircraft positions by either DF-bearings and/or radar position, and immediate dispatching of rescue or search units.

However, once you have departed your aircraft you must depend on what you have with you to attract attention; some of these items that are or will soon be available to you are:

1. The survivor beacon, PRC 17 - PRC 32 or a newer development of these, (see "Crossfeed" 4-60 of April for specifications) provide you with a means of sending a signal to and/or two-way communications with SAR aircraft or ships.

2. High reflectivity equipment —suits, helmets, and raft covers.

3. Visual signal devices such as distress flares, day and night; mirror, tracer bullets, and dye markers.

Do not waste your chemical signalers. But, on the other hand, do not be afraid to use them if you have a vessel or aircraft in sight. A good thumb rule for the use of smoke is: if you can identify the aircraft by type/model—UF, S2F, P2V, R5D, then the pilot of the aircraft will normally be able to see your orange smoke signal. At night, if the search aircraft lights are not seen, you will just have to play it by ear, and remember: flares or tracers can be seen generally better and at a greater distance at night than orange smoke or a mirror during the day.

Your life is more important to you than to anyone else! So, do your share in saving your own life. To help yourself, *first,* know your emergency procedures and use them when you *initially* suspect trouble; and *second,* be familiar with and properly use smoke signals, flares, reflective clothing and covers, mirror, tracers and your survival radio. Then the SAR forces will be better able to assist you. ●

LCDR H. E. Johns is presently serving with Headquarters, Norfolk SAR Coordinator (Commander, Fifth Coast Guard District) as Navy Liaison Officer for Search and Rescue. This billet was set upon a trial basis and LCDR Johns is the first officer to fill it. His duties include the indoctrination of Navy and Marine Corps aviation units in search and rescue procedures, training of tower and radar personnel of the Norfolk DF-Radar Net and duty as advisor to the SAR Coordinator in jet aircraft matters. In a recent report on the new program the Commander, Fifth Coast Guard District, reported that "during the period from May 1958 through April 1960 . . . this assistance resulted in 141 lives possibly saved; and 112 aircraft . . . possibly saved. Since the assignment of the Navy liaison officer there have not been any aircraft crashes whose primary cause was pilot failure to use existing SAR facilities."

*"A fully adequate and lasting solution to the Nation's air traffic management problems will require a unified approach to the control of aircraft in flight and the utilization of airspace. This national responsibility can be met by the active partnership of civil and military personnel * * * ."*

PROJECT FRIENDSHIP

by ROBERT P. BOYLE

WITH these words, the President of the United States, in a special message to Congress on June 13, 1958, offered a bold new concept for the solution of the traffic control problem. Project Friendship is the step-by-step analysis and planning required to assure achievement of the President's objective.

The Federal Aviation Act of 1958 provides the legal framework on which the traffic control structure described by the President is being built. In the words of the President's message, that statute provides for "a unified Federal Aviation Agency charged with aviation facilities and air traffic management functions now scattered throughout the Government * * * ."

Under that law, the FAA is to develop plans and formulate policies with respect to the use of the navigable airspace to insure the safety of aircraft and efficient utilization of the airspace. It is authorized to acquire, establish, operate and maintain air navigation facilities and directed to provide the necessary personnel for the regulation and protection of air traffic.

In the execution of this mission, the Agency is authorized to have military personnel on active duty assigned for service with the Agency in order to assure that the interests of national defense are properly safeguarded and that the Agency is fully aware of the needs and special problems of the Armed Forces.

To support this objective, the Administrator of the Agency is required to give full consideration to the needs of national defense in the performance of his duties. He and the Secretary of Defense are required to provide for the exchange of information on problems, policies and requirements of mutual concern.

Finally, and this is the key to Project Friendship, the Federal Aviation Act provides that the President may transfer to the new Agency any functions of existing Executive Departments which related primarily to operation and maintenance of safe, efficient air navigation and air traffic control systems, including facilities and personnel currently employed in such system, whether they be civilian or military.

With this legal framework, the relationship of the military and civilian agencies in the field of

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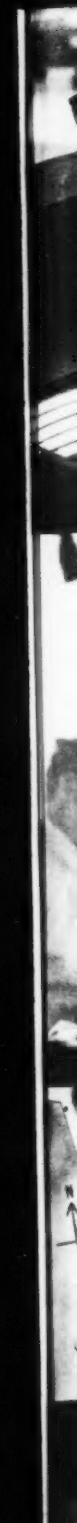

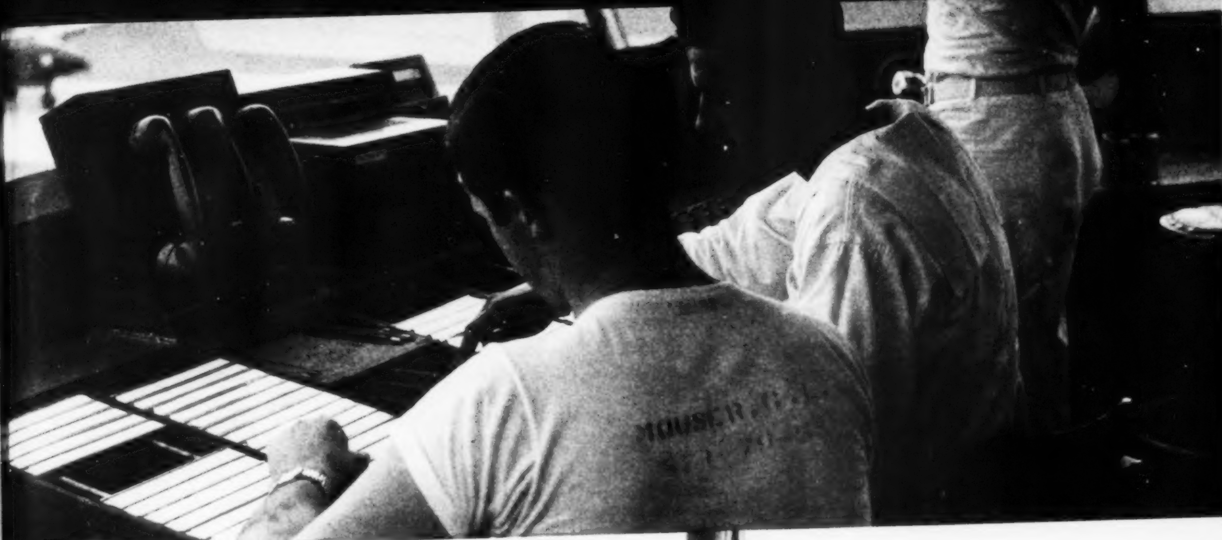
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air traffic control took on new significance. Congress, by the passage of the law, made possible the creation of a single Agency to provide all air traffic control services at both military and civil installations; but it did not create it.

The task of creation was left to the FAA, Department of Defense and the President because of the special requirements of the national defense forces stemming from the fact that they must at all times be sure of their capability of discharging their defense responsibilities in time of war and national emergency. This need posed serious problems in turning over to civilian hands the air traffic control services currently operated by military forces.

Malcolm A. MacIntyre, Under Secretary of the Air Force, testifying before Congress on the Federal Aviation Act, clearly stated this problem, "Since vital functions in the field of air traffic control and the operation of air navigation facilities would be vested in the new Agency, including the performance of these functions at many domestic and overseas military installations in time of both peace and war, it is deemed essential that the Agency personnel engaged in these and other key functions be placed in a career service in peacetime to assure their uninterrupted availability and responsiveness in the event of the sudden onset of war or emergency conditions. Accordingly, we favor the addition of language in this bill looking toward future legislation establishing such a career service."

The legislation finally adopted by the Congress meets this point in two ways. First, Congress directed the Administrator and the Department of Defense to develop plans for the effective discharge of the responsibilities of the Agency in the event of war. Congress also ordered a study to be made of personnel problems inherent in the functions of the Agency, particularly those pertaining to air traffic control. This study was to give special consideration to training, pay, retirement, hours of service, and to develop special provisions to assure the availability and responsiveness and security status of essential personnel fulfilling national defense requirements. Positive solutions in the form of new legislation were to be forwarded to the Congress. Second, the statute provided that the President, in the event of war, could transfer to the Department of Defense any functions of the Agency.

Project Friendship is thus predicated on the basic assumption that FAA and DOD working together can develop, and the Congress will enact, appropriate legislation giving a status for those personnel and facilities fulfilling essential defense requirements which will assure their availability, responsiveness and security status in time of war. Project Friendship helps in the development of a satisfactory answer to this Congressionally posed problem and then proceeds to the ultimate goal visualized by the President—a single, unified traffic control agency. Let's explore in more specific terms what realization of this new concept requires.

The development of a single air traffic control agency to handle the air traffic control needs of both the civil and military traffic in the U. S. has startling ramifications. We start with the transfer of the existing air navigation aids of the military forces to the new civilian agency and this alone is a major undertaking.

Some idea of its size can be obtained from the fact that military forces currently operate traffic control facilities at over 300 locations. At these locations there are more than 2000 individual air navigation aids. The operation and maintenance of this system employs some 20,000 personnel. The Navy's share is slightly less than one-third of the total.

Big as this aspect of the project is, it is only one of several major problems. It is the task of Project Friendship to dig out all associated problems and propose feasible solutions. For instance, the continuous flight testing of air navigation facilities used for traffic control must be arranged—personnel for the operation and maintenance of these facilities must be trained—special services (Military Flight Service, as an example) have to be provided—the special problems of operating traffic control systems overseas and in foreign countries must be studied—adequate logistic and financial support must be developed.

For the past year Project Friendship has been concerned with the details of these problems and probably the best way to understand the scope of the job is to very briefly look at some of the things it has found.

We have already reviewed a few figures on the number of military installations at which defense forces provide air traffic control. Let us break that down a little bit further in terms of the facilities and personnel involved at a typical installation, and let us use a naval air station as an example.

At a typical naval air station (and incidentally this is a specific overseas location), we find the following facilities: Tower, TACAN, UHF/homer, VHF/DF, UHF/DF, GCA (CPN-4). To operate this installation, 36 controllers are needed and these are supplemented by four maintenance personnel for a total complement of 40 men utilized in traffic control functions exclusively. Multiply this by some 300 and you begin to have some concept of the physical facilities and numbers of per-

sonnel involved only in the transfer of the existing plant from the military operators to the new traffic control agency.

The physical plant and its manning is only a part of the problem. For a variety of reasons, not all of the military air traffic control function can be transferred to the new unified agency. Air traffic control facilities and functions relative to military tactical type operation and air warfare training will remain under military control. Consequently we must decide and identify those parts of the traffic control system which are to remain with the Armed Forces.

Another major problem is the method and manner by which the military will retain operational control over military bases where the facilities are located and over the initiation, continuation, diversion or termination of flights of military aircraft using the facilities and the system. All these and other problems are being studied as a part of Project Friendship in this one phase alone.

Project Friendship is also concerned with the problem of providing flight inspection service for the air navigation facilities to be taken over and operated by the new agency. This function has been defined as: "the in-flight investigation and determination of the adequacy and accuracy of flight procedures and the supporting air navigation facilities.

"This activity is essential to the safe and expeditious movement of air traffic. It consists of flight inspecting new air navigation facilities, periodic flight inspection of established facilities and the institution of necessary adjustment of ground equipment to insure the performance of each within prescribed standards of accuracy and range. Flight inspection requires the use of highly instrumented modern aircraft and experienced crewmembers having specialized training and knowledge concerning the operating and performance characteristics of complex electronic equipment under various conditions of terrain, weather and system component malfunctioning."

Project Friendship has tentatively estimated that the proper performance of this function for the air navigation facilities currently being operated by the military forces and to be transferred to the new Agency would require in excess of 20 specially equipped aircraft and 150 personnel. Incidentally, the performance of this function by a

Better service for all users, increased safety through personnel stability, greater economy through a savings in overall manpower and increased combat capability for the military are the aims of Project Friendship.

civilian agency is not new to the Navy. FAA (and before it the CAA) has been performing the flight inspection function for the Department of the Navy under an existing arrangement for a number of years.

Project Friendship must also have answers for the problem of training the air traffic controllers which would be required to operate this system. As indicated, some 20,000 military personnel are currently employed in the operation and maintenance of the military system. Project Friendship is studying the differences in the types of training given in the different services.

Air Force controller training differs from Navy controller training and FAA controller training differs from that given by either Air Force or Navy. Certainly one of the major objectives sought by the Congress in the enactment of the Federal Aviation Act and one of the great advantages to be achieved from a single traffic control system is a uniform standard of traffic control.

To do this we need to standardize the training of the controllers to achieve an acceptable level of proficiency. Project Friendship is engaged in studying the extent to which training objectives and courses of instruction can be standardized and greater utilization by the military services can be made of the training facilities the FAA provides at its Training Center at Oklahoma City.

We have said that Project Friendship is studying the method and manner by which special services such as the Military Flight Service would be continued under the proposed unified traffic control system. Let's take a quick look at what this is.

Military Flight Service generally provides traffic service to military air traffic by handling military VFR and IFR flight plans and by providing military approved clearances. It provides a status file on air field conditions, alerts search and rescue where necessary and provides direction finding or other radar facilities for lost aircraft. In the performance of these functions, it works with FAA services where available within the U.S. Additionally, the Military Flight Service provides hurricane warning information, air raid alert information and processes violation reports. These latter functions are not in any way shared with FAA.

Project Friendship has found that these functions involve in the neighborhood of 350 military installations, employing over 1000 men and requiring use of extensive longline teletype and interphone communication facilities. It is one of the tasks of Project Friendship to develop a plan by which this service can be assimilated in and be performed by the new unified air traffic control service under FAA.

Project Friendship's main task is to decide which elements of the military air navigation and air traffic control system are required to support military or civil needs, either domestically or overseas, and how to phase them into a unified traffic control service. This must necessarily require a decision as to those elements of the military air navigation and air traffic control system which are to be retained by the armed forces in order to meet the unique requirements of military operations and thus not be available for transfer to the new Agency.

Once the size of this basic plant is determined, Project Friendship must then decide what services the system can and should provide, how to obtain and train personnel necessary to operate and maintain it and how to assure its satisfactory performance through a continuous system of inspection.

Stating the major task this briefly tends to minimize other important though subordinate tasks. One such subordinate task is the development of answers for the many problems that will occur should the new agency take over traffic control services in areas overseas, particularly at those military bases which are located in friendly foreign territories.

The status of the personnel controlling the traffic both in their relation to the military authority controlling the base and in their relation to the foreign government in whose territory they practice their trade must be satisfactorily resolved. Another important problem is the technique by which support both logistic and financial will be provided. Once the FAA takes over responsibility for the operation and maintenance of the air traffic control system, normal governmental practice would make the Agency primarily responsible for the budget justifications to Congress required to support the system. However, the military services, as a major user, must support their full share of the costs. Project Friendship is concerned with the method and manner by which this could best be done.

Most of what has been said deals with what Project Friendship is. A few words explaining "why" might be appropriate.

Fundamentally, this is the natural extension of the so-called "common system" of navigational aids that we have had with us for many years. If we have a "common system" of aids why not a "common system" of traffic control based on these aids? The basic reason for both is increased economy, efficiency and safety.

In the words of Lt. General E. R. "Pete" Quesada the Administrator of the Federal Aviation Agency, "These cooperative programs represent a

great economy in the use of manpower and money by avoiding the duplication of facilities, equipment and functions. They have provided and will continue to provide savings to the government of hundreds of millions of dollars as well as provide a greater assurance of safety in the jet age.

"Wherever we can use the same equipment, facilities, techniques, and people—without compromising the mission of either agency—everyone is better off, including the taxpayer who foots the bill...

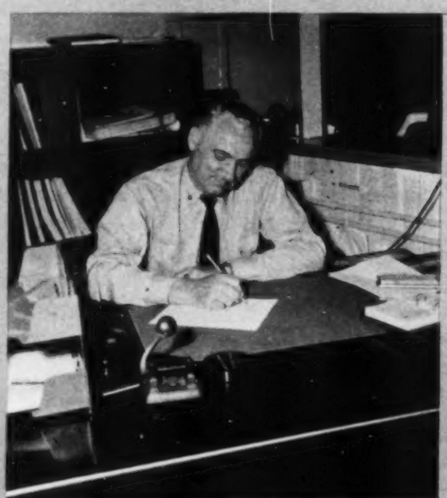
"Once in operation, the system will offer better service for all users, increased safety through personnel stability, greater economy through a savings in overall manpower, and increased combat capability for the military."

This has been only a brief and necessarily cursory exposition of what Project Friendship is. There are many problems that have remained unmentioned. There are ramifications of those that were described that have been left unexplored. One of the biggest and as yet unanswered problems is the fundamental assumption upon which Project Friendship rests—a satisfactory solution to assure the availability and responsiveness of the personnel who operate air traffic control service during time of war or national emergency. On October 3, 1960, in an address to the 5th Annual Meeting of the Air Traffic Control Association at San Francisco, California, Mr. James T. Pyle, Deputy Administrator of the Federal Aviation Agency, said: "We are now taking another approach to this very serious problem and are considering legislation to answer two major points: (a) assuring responsiveness to our national defense requirements; (b) assuring the proper protection for our personnel under any foreseeable conditions. . . . In the meantime, until such legislation or other satisfactory legislation is developed, we plan to go ahead with the implementation of some of the less sensitive and less difficult aspects of Project Friendship—namely, military controller training and the assumption of military flight services and flight inspection functions."

These and many other problems, such as the development of new and better types of traffic control techniques and equipment must be answered in the future if we are to have the kind of traffic control system that the military and civil users require.

The clear call of the President for the establishment of a "unified approach to the control of aircraft in flight" has been answered for its part by the Congress by the passage of the Federal Aviation Act of 1958.

The Executive Branch, both military and civil, is now responding in its turn through Project Friendship. ●



CDR Robert P. Boyle, Senior Associate General Counsel for the FAA in charge of its General Law Division, is a graduate of Harvard Law School, 1938, and served in the CAA's General Counsel's Office from 1938 to 1942. His Navy experience includes tours with VR-4, VR-6 and Staff, Commander, Naval Air Transport Service. He then returned to the CAA (now FAA) where he has served continuously since 1946. CDR Boyle's assignments have required a thorough working knowledge of the evolution of the FAA and new legislation surrounding it, specifically Project Friendship.

WELL DONE

. . . To the two FAA controllers of Radar Air Traffic Control Center, Moffett Field, Calif., who earned a commendation from the CO, VF-124 for their splendid exhibition of skill in averting what could have resulted in an aircraft accident on 27 April 1960. Here's the situation:

An F9F-8T on an instrument training flight had commenced a TACAN approach to Moffett Field under actual instrument conditions. During the penetration, radar contact could not be established and the controller, realizing a potentially dangerous situation, leveled the aircraft at 5000 feet. After a direction-finding steer had been given to the pilot, RATCC proceeded to bring the aircraft safely back to Moffett. It was determined later that the student pilot had inadvertently attempted to fly the Moffett Tacan penetration while tuned to the Tacan station at Naval Air Facility, Monterey.

The commendation stated:

"The manner in which you W. N. Cope, Jr., and J. R. Roe handled this situation emphasizes the important part RATCC plays in flight operations and in the safety of all aircraft departing and arriving Naval Air Station, Moffett Field."

To FAA controllers W. N. Cope, Jr., and J. R. Roe a Well Done!

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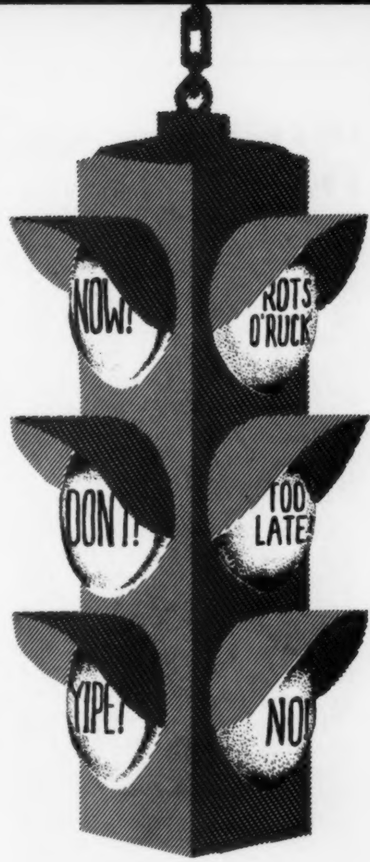
ANYMOUSE

Naval Air Station Memphis put out a bouquet to the pilots from the Gulf coast with a message. "The arrival of training command evacuation aircraft at this station was an occasion of outstanding display of naval aviation. The mass arrival of aircraft . . . created serious problems in the safe recovery of aircraft. As a result of the discipline and care exercised . . . over 300 service aircraft landed safely on a single runway in a period of dusk to darkness without a casualty. (A total of 420 were landed).

" . . . With 500-foot separation and stacked to 10,000 feet, the sky was literally ablaze with lights that resembled a huge rotating chandelier . . . "



HUREVAC STACK

THROUGH the medium of an Anymouse report I'd like to throw some bouquets to NAS Memphis. One noon hour during the fall hurricane season, NAAS Whiting was notified to evacuate due to hurricane Ethel. Four to six hours later a conglomeration of T-28s (in gaggles of eight) descended on NAS Memphis via channel three.

Immediately two holding patterns were established five miles east and west and the flow of aircraft into the break was initiated. But—lo and behold—the Air Force arrived in F-102s, T-37s, and various other type blowtorches. The arrival of some of these jets from distant points precluded the expeditious flow of the now-lowly T-28s who began to stack up like cordwood whilst the torches got clearance via the "low state" route. Sunset arrived and twilight vanished. They began logging night hours.

Things began to get hot and pressing. The T-28s have had to hold for two hours after a two-hour flight and now they too, were beginning to go, one by one, with low state. Mixed into the stacks were formation students—at night, going into the break with as much as 120 pounds of fuel in an eight-plane flight! This is an initiation to night formation to end all initiations!

At one time the controllers had more than 75 "approach control strips," all to be worked on button three. There were T-28s (in flights of eight), UFs, SNBs, S2Fs, T-37s, R5Ds, T2Vs, R4Ds and ADs. At one time a T-28 was cleared number six in the emergency pattern (low state) and an F-102 passed a student on a night landing rollout.

So bouquets to the controllers.

Onions and brickbats to the UFs and S2Fs for nagging, "Tower, I've orbited here for 30 minutes and I'm tired. What's the expected delay?" Some aircraft had to hold for 2.5 hours at night in an eight-plane formation.

FOREIGN OBJECT JAMAGE

OUR flight of three F4Ds taxied out from the line at Cubi Point with a destination of Ping Tung. On the way to the duty runway I finished my pre-take-off check list which included checking freedom of movement of my elevons. When I took the duty I felt certain my "Ford" was in A-one shape. I was No. 2 man and as soon as safely airborne I began a rendezvous turn to the left.

Right then I noticed that the controls became suddenly and unusually stiff. When I tried to level the wings I couldn't. The controls were frozen solid. At an altitude of 1100 feet in a 30-degree bank I got a little concerned, really that is a slight understatement.

I kicked in right rudder and when the wings leveled I put in trim to start the old beast climbing. My stick was laying over to the left so I manually cranked in right rudder to hold the left wing up. Sometime during this excitement I had called the leader (who was also the skipper) and let him know what was going on. Now I looked out the side and saw him sitting on my wing, reassuring to be sure.

At 15,000 feet, and after a series of shallow turns and gentle descents, I told him that the aircraft handled well enough with rudder and trim that I thought I could land it without too much difficulty. As we burned down to landing weight the skipper recommended that I shoot some simulated patterns at 15,000. The hairiest moment of the whole ride came when I put my gear down.

People who have flown the Ford know how bad she yaws when the gear comes down under normal circumstances. Mine started yawing severely and I overcontrolled with rudder which resulted in rolling oscillation about 45 degrees each way.

I knew that if the aircraft ever got over 60 degrees of bank it would be almost impossible to recover with just rudder and trim—especially at 190 knots. Finally I got her settled down and commenced making approaches, gradually slowing to 150 knots. I assured the skipper that she flew well at 150. He took the other wingman and landed as I still had 2000 pounds of fuel to get rid of before I could attempt to get on deck.

The skipper had explained things to the tower and the field was ready for me. My first approaches were to be made with 2000 pounds remaining which would give me several approaches and fuel to climb and eject if I had to. I kept passing Tacan readings to the tower so the helicopter would know my exact position.

The approach to the runway was overwater so I didn't have to worry about terrain clearance. I set myself up on a glide path similar to a GCA and started down on a very long 18-mile straight in. The approach was flown at 145 knots and touchdown was at 135 knots.

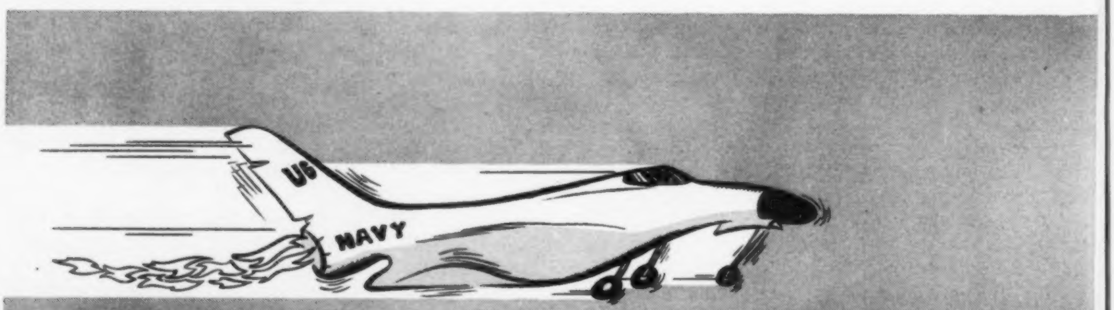
I taxied back to the line and shut down. Our engineering crew immediately started digging into the aircraft and shortly they came up with the reason for my trouble; a wing jury strut was wedged in between the elevon connecting rods, jamming them solidly. After the obstruction was removed the elevons worked fine and we refueled, refiled, and made a peaceful flight to Ping Tung.

Since this happened our squadron policy has been changed and gear of any sort is not carried in the gun bays.

FUEL FOIBLE

AS a relatively inexperienced Anymouse I found out after my hairy tale what my trouble had been—inexperience.

During a division basic tactics hop I had used excessive throttle



and afterburner and by the time we returned to home base I was down to 1100 pounds at the break. Other pilots in the flight had from 1700 to over 2000 pounds. However, I was unaware of this and failed to consider fully the fact that I had plenty of fuel, enough for two or three approaches. I was apprehensive about the whole matter of fuel. My total of 320 hours with only 27 hours in the *Crusader* probably had a lot to do with this.

During most of the flight I had been sucked out of position and without being fully aware of it I was concentrating on making the break and traffic interval look as good as possible to make up for it. Thus, when at the 90-degree position I caught a glimpse of a glowing light, which went out before I could determine if it was the low-fuel or engine fuel pump failure light, I jumped to the conclusion that I had fuel system trouble.

I eased the nose over to pick up airspeed as I wanted to get as close to the runway as possible before I had an in-flight flameout. Then I really started anticipating things. At around the 30-degree spot I felt I had better shut down and deadstick on in to the runway. No sooner was it thought about than it was done. With an estimated 180 knots I came around the horn, dropped the Marquardt and aimed for the runway. The aircraft handled nice and I made an uneventful touchdown and rollout. Not even a blown tire.

However, as you may guess, I was reindoctrinated on all phases of the fuel system and all emergency procedures relating to the F8U fuel control, engine fuel pump and engine malfunctions. Extensive ground and ground flight tests of my plane had revealed no discrepancies.

FUZE BLOWER

WHILE inbound to the Tacan penetration point the pilot of an F9F-8T noted the low fuel boost pump circuit breaker popped. He reset it but during penetration it popped a second time. Again the pilot reset the circuit breaker and once more it popped. The struggle between man and circuit breaker continued all the way down to low approach. When it was reset for the third time, and while over the field boundary, the pilot noticed smoke in the cockpit.

Two circuit breakers had popped this time and heavy

smoke was pouring from the circuit breaker panel. The pilot informed the tower of his difficulties, secured the electrical system (battery and generator), and landed without further incident.

Cause for the boost pump malfunction was not discovered but pilots were again reminded that when a circuit breaker pops, signaling a malfunction in its associated system, that the circuit breaker should not be reset more than once to reduce the possibility of electrical fire or further damage to the malfunctioning equipment.

ROCK & ROLL

ANYMOUSE, the regular copilot of the P2V, was riding the nav table while the navigator was in the left seat, flying an IFR range approach to a GCA pickup for a landing at Naval Station Adak. Inbound on the northeast leg, with the ADF and ARC-5 being used, the navigator saw the low altitude warning light of the radio altimeter commence flashing.

We were passing Great Sitkin Island and he commenced a right turn, letting down, as he believed he had seen the marker beacon indicating station passage. The ADF and ARC-5 were ignored.

Fortunately I was watching from the nav table. I yelled at the PPC in the right seat who had not noticed the goof. He took a quick glance at the ADF, saw the needle still pointing toward the station and realized just how close we were to letting down on top of a mountain. He rolled the airplane back to the proper heading and the approach and landing were completed without further incident but that quick sequence was enough of an incident to last a long time.

(For the last several years it has been doctrine for MATS navigators to monitor all IFR approaches for this very reason. —Ed.)

Where's the Runway?

From the frozen north comes a recommendation to aid pilots landing on snow-covered runways. Even though the runway may be mostly cleared it is likely that runway boundaries and center lines are indistinguishable; therefore, even in the daytime it is helpful to leave the runway lights on bright to assist pilots in lineup on final approach.

Have a problem, or a question?

Send it to **HEADMOUSE**

he'll do his best to help.

Push Button Tuning Progress Report

*Safety of flight problems existing in changing channels under instrument conditions during climbout and instrument approaches has been the subject of discussion in several letters (*APPROACH *Dec '58). At that time it was reported that CNO and BuWeps were then in the process of taking steps to alleviate the problem. Here is the report of action taken by BuWeps as directed by CNO message in Aug 1958:*

Engineering Change Proposals have been requested of all airframe manufacturing corporations listed below to incorporate the Hayes Aircraft Company ID-572 Remote Read-out or equivalent and the C-2459 Control Box. Engineering Change Proposals have been received and processed through the IBCC Board with the exception of the A4D-1, -2 and -2N which is being requested now. The A4D-1, -2 and -2N installation has been rather difficult due to its cockpit size and the density of instruments. The proposed installation of the remote read-out for the A4D series is on the glare shield, opposite side to the angle of attack index light. Four hundred odd UHF ID-572 remote pre-set read-out devices were purchased, while a like number of C-1703 Control Boxes were converted to C-2459 type control boxes. New procurements for backfit ID-572 remote read-out devices were contracted for on 4 January 1960. Deliveries are scheduled to commence in April of 1961. The C-2459 Control Boxes for backfit are under contract with deliveries commencing in March of 1961. Below listed is the aircraft type, the aircraft service change number, the date kits of change parts and the aircraft service change will be available:

F8U-2N—Being installed on Production Line		
F3H-2	ASC-172	February 1960
F8U-2	ASC-306	August 1960
F8U-1	ASC-305	August 1960
F8U-1E	ASC-305	August 1960
F8U-1P	ASC-305	August 1960
FJ-4—Not authorized due to remaining service life of aircraft.		
FJ-4B	ASC-551	March 1960
F11F-1	ASC-115	April 1960
F9F-8P—Not authorized due to remaining service life of aircraft.		
AD-6	ASC-707	March 1960
AD-7	ADC-707	March 1960
F4D	ASC-138—Issued September 1959. Kits available.	
A4D-1, -2, -2N	ECPs being requested for installation of remote read-out at present. Installation problem rather difficult in small, crowded cockpit. Proposed installation is on the glare shield.	

The below listed aircraft will receive the newly developed Touch Tuning System in conjunction with the remote read-out. The remote read-out device is known as the ID-758, it will include manual, pre-set and guard indications. The Touch Tuning Control Box will be the C-2790 and the switching unit is the SA-629.

A3J—12th aircraft and subsequent on Production Line.

A2F—All production aircraft.

F4H—48th aircraft and subsequent on Production Line.

At this writing (Sept '60) two F11Fs were involved in a mid-air collision during a GCI night intercept flight. Just prior to collision the GCI site had directed a frequency change while both planes were in level flight and on constant headings. It is suspected the wingman's attention was diverted to the frequency change and as a result, he collided with the flight leader. The accident resulted in one pilot fatality, one pilot seriously injured and the loss of both aircraft. This possibility re-emphasizes the need for prompt incorporation of the applicable Service Change.

Very resp'y,
HEADMOUSE

Wants Better Wand

Dear Headmouse:

Suggest the development of a better taxi wand, long lasting (perhaps a mercury battery type), more rugged, and for the love of Grandpa Pettibone, make 'em brighter.

R. C. BALL, LCDR,
USNR (TAR) USC '56

NAS Glenview

Chafing Cover

Dear Headmouse:

Upon completion of a recent squadron survival demonstration it was found that the PRC-17 radio transceiver had filled with water.

The transceiver was encased in a water storage bag, ComNavAirPac (General Avionics Bulletin 4-60), upon examination of the storage bag it was also found that small holes had worn through at the ends. This was caused by the screw heads at both ends of the transceiver.

It is suggested the avionics personnel testing and repairing the transceiver replace all gaskets at each inspection.

It is also suggested that the screw heads be covered with tape before the PRC-17 is put into the storage bag.

GUY R. HILL
GUNNERY SERGEANT

HMR(L)-161, MAG-13

► Your suggestions are good ones, Sergeant. To this we add that ordnance tape makes good chafing cover for the screws.

Very resp'y,
HEADMOUSE

Knife Carrying

Dear Headmouse:

I have searched through available copies of APPROACH and have been unable to find anything specific on where to locate a pocket on the flight suit in which to place the survival knife. After much discussion in our squadron safety committee we have decided upon the lower right outer flight suit leg as the place to sew on a canvas pocket for the knife. A few individuals are skeptical of locating the knife in this position because they have heard of incidents of bailout or ejection where the leg of the flight suit has torn off due to shock forces encountered. Have been unable to find anything specific on this except for the loss of a switch blade knife from a flight suit pocket. This information was found in the article "Survival at Sea" in the January 1960 issue of "Combat Crew."

During the discussion in our squadron safety committee we covered what we felt were the safest and most accessible places. The upper leg of the flight suit was considered but remembering difficulties encountered while practicing sliding back in the parachute harness because of the knife pocket being attached high on the leg this position was ruled out. In a recent safety article it was mentioned that wearing the knife on the lower left leg could cause inadvertent actuation of the landing gear handle in the A4D. Therefore in various type aircraft some design feature might dictate the position where the knife would be carried.

The safety committee came up with a recommendation that seems logical. That is, design the flight suit with a pocket built into it in which a standard five-inch survival knife could be carried. This one item would certainly be an aid to parachute riggers who must construct the present knife pocket and sew it on each flight suit. Could you comment on this suggestion?

ANYMOUSE

► The survival effort where a knife might be required can be divided into two parts. First, the escape from the aircraft. This includes cutting one's self free of cockpit or parachute entanglements. Secondly, the survival effort to sustain life until rescue is effected. Here the knife is a primary tool and a weapon.

When mounted, the knife must offer a minimum possibility of interference within the cockpit. Items to be considered here are: 1) Configuration of the cockpit/crew station and seat, and 2) The method of in-flight escape — ejection seat, escape chute or free bailout. Crew duties, type of mission and the kind of personal equipment worn are further considerations. For example: Is the integrated torso garment worn? Is a leg restraint or body positioning system used in the aircraft? Is the crewmember required to move about in the aircraft in the execution of his duties? What is the most probable survival situation which might arise considering the mission?

Taking into consideration the foregoing factors and the strong personal preferences of individual airmen on the question of location of the survival knife, it is believed that a knife pocket built into the flight suit is *not* desirable. Typical example of individual preferences received by the Safety Center: A4D squadron—"hang it on the chest strap on the integrated torso harness." A3D squadron—"along the right thigh." Second A3D squadron—"in pocket on right side of lower leg."

Very resp'y,
HEADMOUSE

P.S. For more info on the survival knife see "A Knife In Time," pgs. 44 and 45.

Category IV's

Dear Headmouse,

I have read OpNavInst 3710.15C and I have been under the impression that I have a fair understanding of the English language. From what I have been told by those officers who are Category IV aviators I am beginning to have my doubts as to my sanity. Special provisions paragraph 11.c states that CNO will not program aircraft or Bravo funds to support proficiency flying for Category IV aviators.

Chapter 15-61 Manual of the Medical Department states that Group III aviators will only pilot dual control aircraft accompanied by a Group I or II aviator "qualified in model."

My questions:

1. Is a Category IV aviator permitted to fly regular commitment flights when Group I and II aviators are available; want, and need the time and training?

2. What is meant by the term "qualified in model?"

3. Are not these Category IV (Group III) aviators burning up Bravo funds allocated for Group I and II aviators?

4. Who do you go to if any of the above questions are adverse to present interpretation of OpNavInst 3710.15C and Manual of the Medical Department, Chapter 15-61, by Group III aviators?

Don't tell me to go through the chain of command. They (Group III) sit astride it.

PSYCHOTIC MOUSE.

P.S. Is a second-tour pilot required to have 250 hours in model as per 3740.4D, C, 3, or is the 250 hours only a requirement for first tour pilots?

► Headmouse can only answer some of your involved questions, but here goes.

"Both the Manual of the Medical Department Chap. 15-61-(1)(c)(1) and BuPers Manual, art. C-730(4)(c) 1 state the following concerning Service Group III Naval Aviators. 'Normally operate only aircraft equipped with dual controls and be accompanied on all flights by a pilot of service group I or II qualified in model aircraft operated.'"

As regards the P.S., the reference mentions specifically first tour pilots and defines that term, and apparently it is considered that 2nd tour pilot requirements will be set by the command. Good luck.

Very resp'y,
HEADMOUSE

OUT IN THE COLD

OLD Man Winter is with us. The leaves have fallen, the corn has been cut and the mornings are right nippy.

What has this to do with the servicing of aircraft and turbojet engines?—Plenty!

Winter brings with it many problems: snow and ice, cold and freezing rain, fog and just plain cold air. These cause airplane and engine icing, slow starts, thick oil, condensation and cold hands.

All AF and Navy equipment is designed to operate through a wide range of environmental conditions. General Electric engines have been tested at the top of Mt. Washington in New Hampshire, in the climatic hangar at Eglin AFB, and at some locations in Alaska.

These tests are run to ensure as nearly as possible that the equipment will operate anywhere at any time.

Most of the problems associated with cold weather and turbojet engines fall into the starting category. Some other areas are affected, of course, and these will also be discussed.

A good external power source for starting is required. Power requirements for the engine are higher, and if the power cart is operating at low efficiency, you have two strikes against you from the beginning. Now is the time to start having the carts checked out, so that maximum power output is available when you're ready for it.

When the cold weather hits, you'll have a good power cart. The next step is to get the compressor-turbine rotor turning.

Cold lubricating oil is highly viscous — this means it's like molasses. The engine and accessory bearings and gears are coated with it. Torque requirements will be high and proper circulation of lubricants will be lacking until the oil begins to warm. Low speed operation for a short period of time is indicated. High initial oil pressures may be noted. Be sure that the correct oil grade for the temperature conditions is used.

After the parts are rotating comes ignition. Fuels, to be effective, must vaporize. When they are warm, they are volatile and they vaporize easily. As temperature goes down, volatility decreases. This means that more fuel is needed and a hotter ignition arc is required.

GE engine fuel and ignition systems are designed to automatically compensate for these conditions. If they are well maintained, little or no difficulty in this area should be met with.

Unequal expansion and contraction rates enter into the picture too. Heavy turbine wheels and light shroud rings and mating parts of different

materials may cause interference during starting and shutdown operations. Correct starting and shutdown procedures will help to minimize such problems. Rotating the rotor by hand if possible prior to starting will ensure that no interference exists before power is applied. Cooling runs on shutdown will help equalize contraction of parts.

Condensation may also become somewhat of a problem under certain conditions. While cold air contains little moisture and will cause few problems, an engine or airplane which has been in a warm hangar and then moved outside may be susceptible to unwanted moisture. If the temperature is below freezing, some signs of ice may also be noted.

Compressors and turbines have been known to freeze in place, putting an undue load on the engine starter. The starter windings or shaft may be damaged under such conditions.

Inlet and exhaust covers should also be used to keep out rain and snow when the engine is not running. Even small amounts of ice can lock a rotor due to the close tolerances of seals and shrouds.

In general, electrical components, except batteries, are not particularly susceptible to cold weather conditions except for, perhaps, condensation. However, wire, plastics, and other materials used become more brittle at low temperatures. It is wise to handle electric and electronic components, cables, etc., carefully to prevent unnecessary damage. If a component change can be made shortly after a shutdown, or with the use of an external heat source, damage may be reduced.

On engines which have fixed-area exhaust nozzles, it's important to check exhaust gas temperatures when operating in a wide range of ambient temperatures. It may even become necessary to change nozzle tabbing to keep EGT within specified limits. Use of the Jetcal Analyzer should not be overlooked if there is any doubt.

Foreign object damage rears its ugly head during the winter too in the form of ice chunks. Engine and aircraft anti-icing systems are supplied to be used for ice prevention and not after everything is coated with ice. If there's a hint of icing conditions, the systems should be put into use.

Don't forget, too, that ice on inlet screens and compressor blades and vanes can cause trouble. Decreased air flows, increased angles of attack, increased fuel flows, overtemperatures, and stall susceptibility can all result. Check your technical orders for specific instructions.—*GE Jet Service News*

To Arms! To Arms!

AT DAWN the cries rang through the dark halls of King Arthur's court at Camelot. Across the moat sat an ominous figure astride a huge black horse. His armor, like his horse, was black. He said not a word, but waited patiently, giving the impression he had done this many times before.

Inside the castle, knights were assembling in the huge banquet hall. Some were fully clad in armor. Others were partly dressed and looked half asleep. In one corner stood a knight clad in silver armor. His armor had earned him the title "The White Knight." He was one of the knights to whom King Arthur was speaking.

The expression on the king's face was grave. As he spoke he was appraising the knights before him. His eyes were fixed on the White Knight as he said, "This morn ye go to meet one who has killed many of thy comrades. Guard thyself well."

The White Knight smiled and strode from the hall, cheers and good wishes ringing in his ears. In the courtyard he mounted his steed and accepted a new lance from his squire. With a nod and a smile to the assembled crowd he spurred toward the slowly lowering drawbridge. As he clattered across the bridge the "Black Knight" rode to meet him.

For a long minute the two knights faced each other. They dipped their lances in salute, turned and galloped toward the opposite ends of the list. When about a hundred yards apart they wheeled their mounts and once again faced each other. Each settled himself more firmly and waited.

Suddenly the strident note of a trumpet shattered the morning calm. The horses quivered, and as the last notes died away, they rushed forward.

King Arthur watched the two knights as the distance between them lessened. As they came together the king noticed that the White Knight's horse shied ever so slightly. The White Knight's lance struck the Black Knight's horse in the neck and broke near the tip. This didn't stop the charge of the Black Knight. His lance never wavered from its target, a point between left shoulder and breast plate. After the charge was finished the White Knight lay in a pool of blood.

For a long time after his young son had fallen asleep the skipper of MARATTACKFITTRANSHELICOPTRON 4 looked at the book of King Arthur's Tales that he held in his hand. The similarity between the knights of King Arthur and his own squadron seemed very strong.

How many men did it take to ready the White Knight for battle? Before he rode out on the fateful morn how many dozens of hands had knowingly or unknowingly determined his fate?

Who trained the horse that shied at the crucial moment? Who carved the lance that failed? Who tempered the armor that didn't deflect the Black Knight's lance?

If you had been the armorer, the horse trainer or the lance maker would you have sent the knight out to do battle equipped as he was? No! At least, not knowingly. There, mused the skipper, is the rub! Each of us likes to do his job well, but sometimes we forget how important it is. We don't make sure our work is always our best! Every time the pilot of today climbs into his aircraft how many hands does he depend on? Like the Knight, is it a matter of a few dozen? No! Every time his aircraft leaves the ground the pilot places faith in thousands of pairs of hands, each doing an important job. His performance, his safety, his very life are in your hands.

Don't be satisfied with just doing a job, do your work as if lives depend on it. THEY DO! ●

by J. W. Lazzo, Capt., USMC

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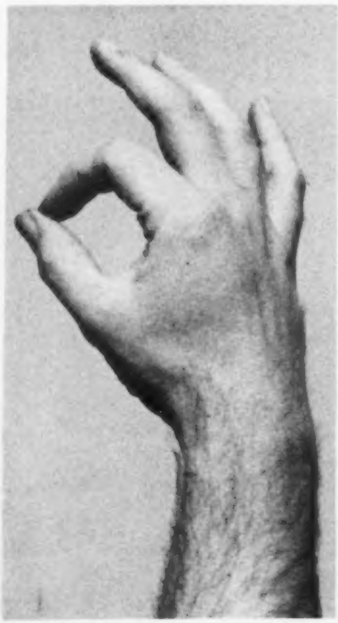
HOW'RE YA FITTED FOR BLADES?
DRAGON CHASER (SMALL)
DRAGON CHASER (MED.)
DRAGON CHASER (BIG)
DRAGON CHASER
ART LOVES GUN
AND DON'T YOU FORGET IT!
ART
SIRE!
HMI

HANDMADE

truth and consequences

A REVIEW OF SIGNIFICANT AIRCRAFT ACCIDENTS

Pity the poor landing gear handle. If all the mismanagement and abuses connected with this particular cockpit control were laid end to end they would stretch all the way from here to there, and that would be a long, long way. That doesn't make sense? Of course it doesn't; neither do some of the reasons which cause trouble with the landing gear. Here are a few recent examples:



Aircraft: JD-1
Pilot: Experienced
Lookout: Limited experience in cockpit
Date: 6 May 1960

The young plane captain who rode the right seat was briefed to raise the landing gear handle upon the pilot's thumbs-up signal. During the takeoff run the pilot expected to receive the usual hand signal from the plane captain concerning the engine instruments — thumbs-up for satisfactory operation, thumbs-down for unsatisfactory operation.

Glancing at the right seat occupant and not receiving a signal, the pilot got the plane captain's attention with a thumbs-up. This was only intended to be an interrogatory signal about the engine instruments but the plane captain apparently had just one thing on his mind. When he saw the thumbs-up he raised the landing gear just as he had been briefed to do. The JD was not yet airborne and in spite of back pressure on the yoke it settled enough to grind the ends off the props. Damage was discovered on postflight inspection.

Aircraft: TV-2
Pilot: 90 hours in model; 1700 total hours
Date: 11 May 1960

Although the pilot was considered qualified in the TV-2 his regular airplane was the F3H. His planned takeoff on an extended cross-country was delayed an hour for minor servicing but finally he commenced his takeoff run.

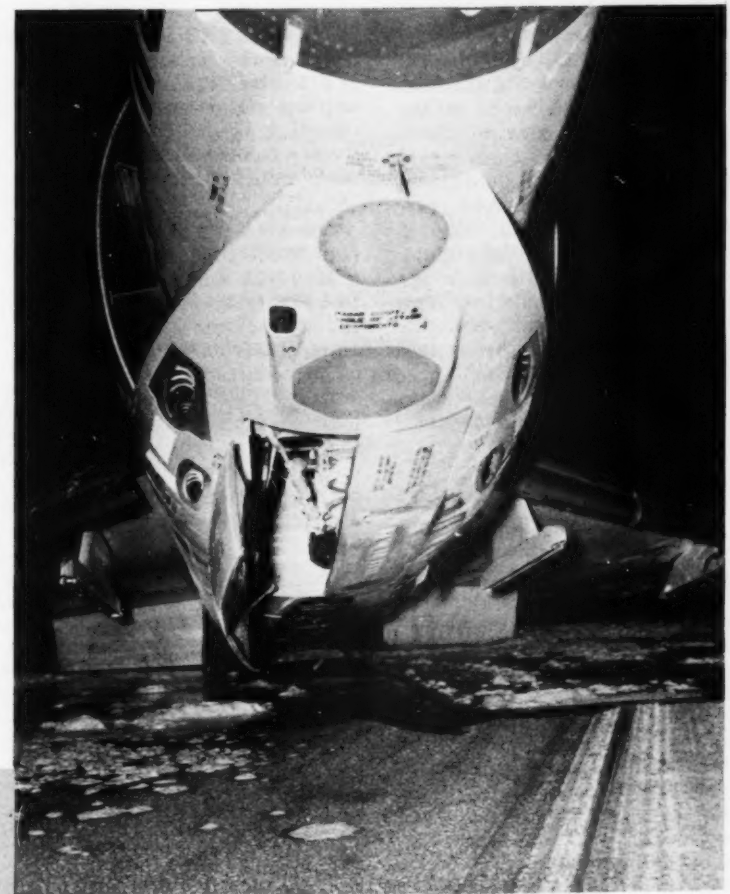
No definite method of determining a safe airborne condition was used, other than sensing that the aircraft was light on the wheels and bouncy at 115 to 117 knots. Distance normally traveled in an F3H takeoff may have also given him a false feeling that the TV was ready to fly. Assuming he was "airborne," the pilot retracted the gear.

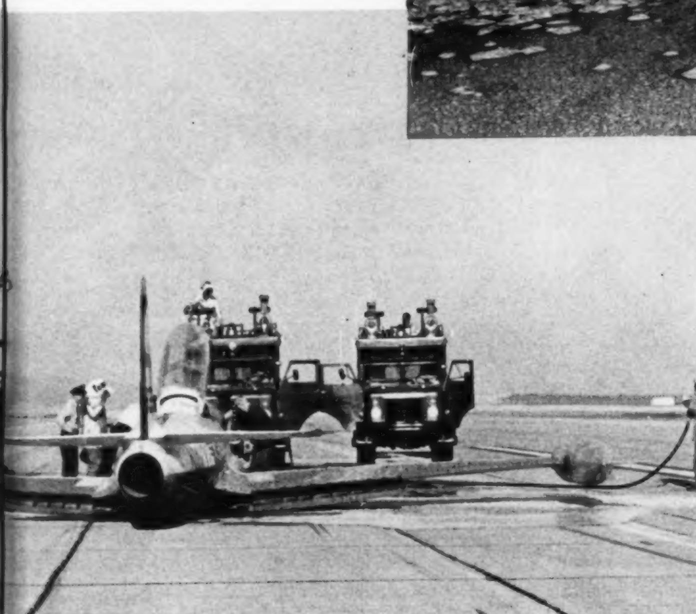
The TV-2 settled onto the

runway 3900 feet from the starting point of the takeoff and slid another 3100 feet on its belly. The anxiety of the pilot to make the flight was evidenced by the fact that he requested assignment of another aircraft within two hours after the accident. What action was taken on this request does not appear in the accident report.

Aircraft: F3H
Pilot: 150 hours in model; 1600 total hours
Date: 23 May 1960

After the F3H was preflighted by the plane captain, arrangements were made for defueling as it was scheduled for night MLP. In order to defuel the wings, the landing gear lever must be placed UP. From the point of defueling, a relatively inexperienced man was assigned the task but he conscientiously obtained a refresher on procedures from a line petty officer before proceeding with the work. Later, he could not remember whether he placed the gear handle DOWN when defueling was finished.





The aircraft was not inspected again until the pilot made his preflight walk-around. He was about 25 minutes late in manning his assigned aircraft (due to the defueling) and afterward he did not specifically recall checking the position of the landing gear handle. Neither did he recall getting a positive test of the warning light or seeing a warning light in the gear handle.

Cleared for takeoff, the F3H roared down the runway but after 2900 feet of ground roll the landing gear retracted. The

Demon settled on its belly and skidded 2100 feet to a stop.

A check of the flight manual showed the plane would normally be at about 120 knots at the point where the gear collapsed. At this speed the oleos would be extended enough to actuate the microswitch, thereby permitting the retraction. One of the links in the chain of circumstances was a loose bulb in the landing gear handle warning light. After this bulb was tightened one-half turn the system functioned perfectly.

Aircraft: SNB
Pilot: 150 hours in model, 1500 total hours
Lookout: A plane captain with limited experience in the cockpit.
Date: 30 May 1960

Prior to taking the duty runway, the pilot informed the plane captain that he, the pilot, would handle the gear himself. Other than requesting the plane captain to lock the tailwheel no other cockpit duties were discussed or assigned.

After applying full throttle the pilot checked the throttle friction then put both hands on the yoke. Without being briefed about it, the plane captain backed up the throttles; an action which is traditional in *Beechcraft* takeoffs.

In recognition of the plane captain's assistance the pilot gave his approval with a thumbs-up signal. This another tradition, innocent in itself but fraught with danger if misunderstood. And it *was* misunderstood. After thinking over the purpose of the signal for a few seconds the plane captain came to a decision. "I didn't know why he gave me thumbs-up," he said, "I then thought that we had cleared the deck so I thought he wanted me to raise the gear and that's what I did."

This action went unnoticed by the pilot and he was caught unawares when the plane began settling to the deck. When the prop tips started nicking the runway the SNB was estimated to be moving at a groundspeed of 67 knots. Wind down the runway was six knots.

Aircraft: R4D-8
Pilot: Experienced
Copilot: 16 hours in model; 800 total hours
Plane captain: experienced
Date: 26 June 1960

A 30,000-pound gross weight, a 4200-foot runway, and a 300-foot high ridge near the upwind end of the runway, resulted in an emphasis on short field takeoff procedures.

The plane commander told his passengers not to be alarmed if the hills appeared a little close on takeoff. He briefed the copilot to watch instruments, call airspeed, and handle the radio. The plane captain was to position himself between the pilot and copilot and handle gear and flaps. He was ordered to unlatch the gear without verbal order upon visual passage of a certain taxiway intersection and to standby to retract the gear immediately upon verbal order.

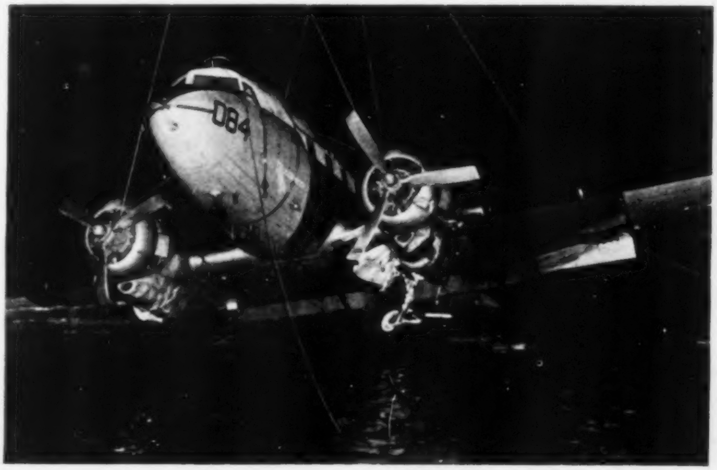
This would be the ninth takeoff for this crew and the plane captain had been conditioned to expect only a verbal command from the plane commander as his execution signal for gear retraction. The briefing instructions to retract the gear immediately upon verbal command appear to have been indelibly impressed on him.

Takeoff was commenced but halfway down the runway the pilot chopped the throttles; he was conscious of the height of the obstacle to be cleared and unsatisfied with the distance which was available for the task. Due to this very situation it was common practice for pilots to takeoff in the opposite direction, which was to seaward, even with tailwinds up to 15 knots. In this case the tailwind would be 12 knots and the pilot decided to accept this in preference to trying to clear the obstacle.

During the attempted takeoff the plane captain had unlatched the gear safety latch upon passing the specified taxiway. As soon as the run was aborted he returned the latch to lock posi-

tion. After aborting the pilot continued on down to the end of the runway, swung the airplane around, and lined up for another try. He stated that the briefing remained the same. For the plane captain this meant he would again unlatch the gear safety latch without command as soon as the plane passed the taxiway intersection. It also implied that the first verbal command would be to raise the gear.

Takeoff was initiated. As on the previous run the radioman



informed the plane captain that they had passed the intersection and the gear was unlatched. Now came the deviation from briefed procedures. Shortly after passing the intersection the pilot shouted a command.

This shout was variously interpreted on the flight deck as "unlatch," "unlatch the gear," but most important, it was interpreted by the plane captain as "RETRACT the gear." Impressed with the necessity for rapid retraction and more tense following the aborted takeoff, he reacted immediately. At this point airspeed was reported as 90 knots.

Shortly thereafter the left gear sagged. The port prop began nibbling the runway and the pilot attempted to pull the aircraft off the ground. It was airborne for about 600 feet but engine vibration was severe and the pilot reluctantly cut the throttles for his second abort of the day. Although the plane captain recognized his error and returned the gear lever to the down position, the R4D-8 went off the end of the runway with the gear partially folded. There were no personnel injuries, even to the unsecured plane captain.

The practice of utilizing the plane captain to handle gear and flaps in R4D-8 aircraft necessitates that he assume a position between pilot and copilot. The location of the gear latch in R4Ds is such that it is difficult for the copilot to perform the task of unlatching the gear without loosening his shoulder straps and diverting his attention from other cockpit duties in a critical phase of flight. It is dangerous for the plane captain in a crash but the practice is nevertheless in wide use. This could be considered an admission that pilots will find the easiest (or most realistic if you prefer) method of doing a job, even if it involves a technique considered incorrect by written instructions.

Another admission is necessary at this point.

Over a period of time it is possible to collect a number of similar accidents and then present them as a group in order to gain greater emphasis for a particular subject. This is an honest research technique, perhaps overworked at times, but valuable in exposing so-called "isolated" cases as actually common occurrences. No attempt to use such a treatment was needed here. A simple review of the dates on which these premature retractions occurred will show it was not needed. *These five cases (goofs) which you just read happened within the short space of seven weeks!*

From this you can conclude that some pilots, crewmen, and lookouts are confused by the entire "signal" situation.

A more specific point can be put this way: "Brief the flight, and fly the brief." If you *brief* one way, don't *do* it a different way.

The engine instrument check, including a signal for good or unsafe operating condition, appears to have a definite place in multi-engine cockpits. It also appears that the thumbs-up signal, once confined to raising or lowering the landing gear, is now used in so many ways that its meaning is often misunderstood. One pilot even commented that he "reserved the thumb signal exclusively for the engine instrument check." At the risk of confusing the issue a little bit more, we can ask what ever became of the once common three fingers and a circle which meant approval or "all is well."

This concludes the defense for the poor innocent gear handle. To those who must continue to use this device: Good luck and thumbs-up—oops, er, well good luck anyway. ●

OIL PRESSURE AND POWER SETTINGS

Loss of pressure is always a source of consternation to pilots. Authorities on the J-57 and J-65 engines say that with proper corrective action chances are good that you can nurse your jet to a safe landing. Here are the theories and three reports of experiences which tend to back them up.

J65

RECENTLY we attempted to make the point that complete loss of oil pressure in a J-65 did not constitute a dire emergency as long as the engine was still running. In other words, with the proper corrective action, haste was not necessary. We have since received many queries on this subject, because it is not only a vital subject, it is also one that is controversial, misleading, nebulous, and non-commital. If you lose oil pressure you are in trouble, but how much trouble depends on how much you know, how old or new your engine is, whether or not a bearing has failed, and most of all—whether or not you have moved the throttle.

In order to clear the air, we offer the following information upon which to base squadron policy. It cannot be guaranteed that a J-65 will run for a definite period of time with zero oil pressure even though individual engines have run for as long as 45 minutes with zero oil pressure. Unofficial information from WAD Representatives indicates a maximum of 17 minutes running time, with no oil pressure, in actual tests. We will guarantee one thing, however, and that is in the event of zero oil pressure a substantial reduction or addition of power beyond that required for level flight is sure engine failure, especially if the change is made rapidly.

There are two situations that spell unmistakable trouble if not handled correctly. Both conditions require a direct line of flight to the nearest usable airfield and a modified flameout approach to be on the safe side.

Condition 1: Fluctuating oil pressure or complete loss of oil pressure.

In this condition the pilot should maintain altitude if high enough for a flameout landing, or climb to an altitude which will permit a simulated flameout approach, without advancing throttle, and proceed as soon as possible to a point at which a landing can be made. The throttle should be retarded slowly to reduce thrust loads on the bearings, but not below a thrust level at which flight and landing can be accomplished. During landing maintain as much thrust as possible up to that required for waveoff slowing the aircraft by means of drag devices. So long as no vibration develops that en-

(Continued on next page)

J57

OIL pressure limits are established at minimum 30 PSI and maximum 50 PSI. However, keep in mind that minimum continuous oil pressure reading is 40 PSI. If the reading is low, relieve the thrust and maneuvering loads on the engine as much as possible and bring it home. But once again don't rush yourself into trouble—that ole J-57 won't let you down before you can get home just because the oil pressure is a little low. The reason for reducing power and not pulling a lot of load factor is to relieve the strain on the engine bearings as much as possible while they are being undernourished.

High oil pressure is a slightly different matter—it can mean a malfunction in the regulating and relief portion of the system or it can mean a restriction in the system. A restriction could result in complete lack of lubrication to one or more bearings. In any case, reduce power and try to bring the readings down to normal while heading home. Give the engine the same gentle care that we outlined before.

If pressure is high due to a restriction in the system there is a possibility of failure of the mal-lubricated part unless you take recommended action. If the pressure is high due to pressure regulating deficiencies, the bearing seals will fail if action isn't taken. In either case it's a good chunk of money you save for Uncle Sam if you can nurse it home without further damage. However, never favor the engine so much that you compromise the whole aircraft and yourself.

—*McDonnell Voodoo Digest*

YUMA, Arizona to Dallas was the first leg of my flight back to an East Coast air station. I filed for flight level 420 and estimated 1 plus 48 enroute. The F8U was preflighted and I was off and climbing about an hour before noon.

On turnup the oil pressure had read 44 psi with military rated power. During the climb it fluctuated one or two psi but this was not considered unusual since the aircraft had a long history of such indications. Considerable turbulence was encountered during the climb which caused most of the cockpit instruments to oscillate slightly and some of the oil pressure os-

(Continued next page)

gine is not likely to seize, but it should be flown as though it might seize at any moment. During letdown to a landing, maintain a position which will permit a flameout approach.

Condition 2: Abnormal vibration.

If abnormal engine vibration occurs, reduce power gradually to maintain safe flight and controllable landing and land as soon as possible. If vibration persists and/or becomes excessive, retard throttle further if conditions permit. Make throttle movements slowly, because if the vibration is the result of bearing failure, retarding throttle rapidly to low power setting may aggravate the engine's ability to accelerate when advancing throttle. This is due to increased friction.

To sum it up, if the power can be adjusted smoothly to a setting that will allow flight back to the nearest field, there is a better than even chance that the engine will continue to function until a landing is made. Above all, do not attempt to overfly a suitable field for the convenience of landing at the home field. Your engine may run for a minute or it may run until the fuel is exhausted. But everything over the first minute is borrowed time and we wouldn't advise borrowing any more than is necessary. *—ComNavAirPac AvSafBul.*

A STUDENT pilot with 11 hours in the F11F noted normal oil pressure on engine runup but when he reached an altitude of 8000 feet the oil pressure was seen to drop to 30 pounds pressure. He continued climbing and monitored the oil pressure carefully. The pressure continued to drop, down to 22-25 pounds. Wing fuel was dumped on the advice of the instructor. At 20,000 feet oil pressure was down to 18 pounds.

Power was reduced to 90 percent rpm, then further reduced to 80 percent but there was no change in oil pressure. An emergency was declared and a precautionary flameout approach began. Gear and flaps were lowered at high key and although this position was good, the remaining checkpoints in the pattern were badly overshot, resulting in the pilot taking his own waveoff. A normal pattern and emergency field arrestment followed.

Normally only one approach per oil system malfunction can

cillations occurred during this turbulence.

The climb took 13 minutes after which power was reduced to around 88 percent rpm and the oil pressure was steady at 43 psi. The next 45 minutes were uneventful. El Paso slid by and I passed a position report.

Then shortly after passing Guadalupe the cockpit suddenly filled with a heavy, whitish, grey smoke and cockpit temperature started increasing. I immediately turned the temperature control down, reduced power to 80 percent and started a letdown. My intentions were to get to 35 thousand and turn off the pressurization to stop the smoke, then open the emergency cockpit vent door to clear the cockpit.

Oil pressure was still steady at 43 pounds. I had just started to call Center to advise of my change in altitude when the oil pressure suddenly dropped in rapid succession to 20, then 10, and finally to zero. With this development I turned IFF to Emergency and UHF to Guard. My thought was that the trouble might be in the forward section of the engine to give me the smoke. I dropped out the Marquardt because I wasn't sure how long the engine would run with zero oil pressure, or when I would have to shut it down. I decided to let it run at 80 percent for as long as it would.

A broken cloud deck was below me so I made a rapid descent to get under it and look around for a field. Nobody answered my call on Guard and when I rechecked the radio I found I was on Manual instead of Guard. Correcting this, my Mayday was answered by numerous stations. The terrain looked very barren as I searched for an airfield, town or anything which resembled civilization. My intention was to land at a field if the engine lasted that long or eject when I got down to 5000 feet. At this point I was 128 Tacan miles from ELP going 325 knots indicated at 26-thousand feet.

I began hoarding altitude at the expense of airspeed. Webb AFB had the strongest communication strength so I established contact with them and most of the other stations went off the air. Webb came up with a DF steer, then Pyote radar, who was painting me, gave me mileage to Webb. It looked like I was too low to make Webb so Pyote passed a steer to Wink airport. By now I was down to 12-thousand but according to the information I received, Wink was seven miles to starboard. I turned to a heading of 135 but couldn't see the field.

Webb told me there was a 7-thousand foot hard surfaced runway at Wink. I kept looking but the field apparently blended in well with the landscape. Only when it was on my port beam did I see it, and as is normal, wondered why I hadn't been able

be anticipated due to the critical nature of an oil malfunction in the J-65 engine. The first approach must be a good one. Extenuating circumstances exist in this case—scattered cloud coverage at 3000 feet in the vicinity of the field contributed to the student's missed approach and fortunately he had not suffered a true oil system malfunction. All evidence points to the fact that the oil level was low and that the aircraft had not been properly serviced following a draining and flushing of the system.

THE Grand Canyon of Arizona—what a bleak place to have oil pressure trouble. Radio transmitter failure prevented the A4D pilot from calling his wingman. The wingman's canopy was frosted over and the leader was unable to communicate the nature of his trouble by using hand signals. For this reason, and the possibility of losing all contact with the wingman, the lead pilot decided to return to San Diego.

Initial trouble had come with a sharp engine vibration, fluctuation of oil pressure from normal to "lo" and back to "norm," and a momentary rise of 50 to 100° in exhaust gas temperature. This condition continued intermittently until final approach when the engine vibrated continuously, EGT pegged on the high side, and the RPM, when last noticed, was descending through 20 to 25 percent. Engine seizure and landing rollout occurred at approximately the same time.

The outcome was successful though it could not have been positively forecast to come out that way. *No power changes were made* nor did the pilot make any abrupt maneuvers on the way home. This is a possible reason why he was able to fly the 250 miles without having the engine seize sooner than it did.

It was squadron doctrine to land at the nearest appropriate airfield in cases of this nature. At the next all pilots meeting the pilot stood up and very pointedly, using himself as an example, impressed all pilots with the possible consequences of failing to abide by established SOPs.

The necessity of carrying sufficient "divert money" must have come up on the same program. When the trouble first appeared the aircraft was within easy range of "Lost Wages," Nevada (Nellis AFB) and on the way back to San Diego the pilot passed near Palm Springs (BL4 H70). ●

to see it before. Webb passed me the surface wind, west, northwest at 5-8 knots. It looked like I was in a good downwind position for a flameout approach to runway 31 so I dropped the gear and raised the wing. Runway 31 also looked like the best one as all the others had ditches at the ends. I was at a rather nonstandard 180 position (6000 feet and 200 knots) for a FOA but something more important came to mind. In my concern to find a field I had failed to dump wing fuel, about 2000 pounds was still aboard. Turning off the 180 I hit the dump switch.

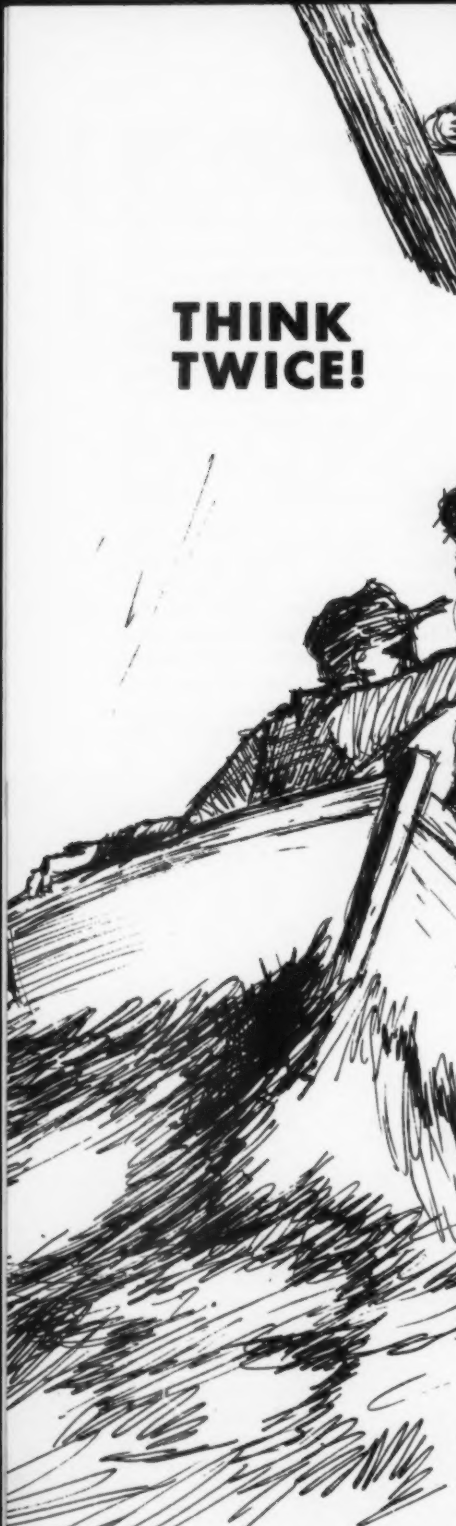
For ten minutes now, the oil pressure had been at zero. I expected to lose the engine any minute. The engine was still at 80 percent and I held 180 knots. As I rechecked the runway I realized the field elevation must be two or three thousand feet. All of a sudden I was pretty close to the ground. A sea-level type pilot is prone to forget this important detail in times of stress.

Turning the wing dump OFF, I concentrated on the landing. As soon as the field was definitely made the engine was secured to decrease my rollout distance. Initial touchdown was close to the threshold but was fast, about 150 to 160 knots. I ballooned and touched down again about 2500 feet from the approach end. This should have left me with around 4500 feet of hard surface but I found out later I didn't have it to begin with, it was actually a 6328-foot runway.

Gross weight at touchdown was approximately 22,200 pounds. Aerodynamic braking was used until I had slowed to 100 knots, then I lowered the nose to the deck and got on the brakes. The airplane was slowing down but I could see I was going to do a bit of cross-country traveling through the brush. At 1500 feet from the end of the runway the starboard tire blew. After that I mostly tried to keep the airplane going straight. The port tire blew about 500 feet from the bitter end of the runway.

At 50 knots I went off the runway in a cloud of dust. The starboard tire ripped off the wheel after a hundred yards then the main gear started digging into the sand and the jolting came to a stop with the airplane axle deep in sand. I had previously secured everything while rolling on the runway so I just opened the canopy and jumped over the side into zero visibility. The airplane had kicked up a big cloud of dust so I ran until I could see then just stayed well clear until the dust settled.

As the shape of my once shiny F8U gradually became visible there was no apparent sign of fire but I knew one thing for sure. I was going to catch hell from the plane captain. It was the dirtiest airplane I had ever seen. ●



THINK TWICE!

THE ejection was routine. The midair collision had occurred at 2500 feet and at the time the pilot elected to leave, the airspeed indicator read 300 knots. The seat released automatically and the pilot attempted to beat his automatic parachute opener. Before he could locate the D-ring, he was looking at the fully deployed parachute canopy overhead.

He couldn't seat himself in the harness sling but hanging by the leg straps was bearable. The force with which he struck the water surprised him. After some difficulty, he released his parachute and was picked up by a small fishing boat. Up to this point, the survival episode was uneventful and well executed.

While on the fishing boat, the pilot lit a flare to indicate to a circling plane that he was safely aboard. A passing HUK saw the smoke and flew to the boat to effect a rescue. The pilot's statement reads: "The pick-up was somewhat precarious, as there was no sling aboard. After the HUK was finally able to get in position without blowing the boat away, the crewman in the back seat held a hand out and when he was able to get a hold on my hand started pulling. I

notes from your FLIGHT SURGEON

was able to get a precarious foothold on some part of the wheel assembly and finally was pulled aboard."

After the pilot had been pulled safely aboard the fishing boat, the routine survival episode became extremely hazardous for no apparent reason. Not only the pilot's life but the safety of his rescuers and their boat as well as that of the helicopter and crew was unnecessarily jeopardized in a needless attempt to expedite return of the pilot to his home base.

There are circumstances which require the utmost speed and occasional risk in rescue work. For instance, an injured pilot must be retrieved from the water immediately . . . a billowing parachute dragging an unconscious survivor must be collapsed immediately. But there can be little justification for risking lives and planes to return an uninjured survivor to his home base a few hours sooner.

The pilot in question was safe aboard the boat. Since he was in no immediate danger, a properly equipped helicopter could have been sent to effect a normal rescue sling type of pickup. If the pilot had suffered any type of back injury in the accident, this one-arm pickup could have resulted in permanent paralysis. If either the pilot or helicopter crewman had lost his hand hold, the pilot would have fallen to the deck of the boat with the possibility of serious injury.

There is a need for aggressiveness in all rescue work but that aggressiveness must be tempered with common sense. *Think twice* before attempting a rescue for which you are not equipped . . . of a man who does not require rescuing. *Know your equipment, know your procedures and know your limitations.*

'Not Cold'

AN S2F-1 pilot in a landing accident aboard the carrier did not wear flight gloves because "he thought they were to serve the purpose of protection from cold and it was not cold," the flight surgeon reports. *Protection of pilots' and aircrewmen's hands from burns in the event of fire is the primary purpose for wearing gloves.* Fortunately, in this case no fire broke out.

'One Try Only'

A PILOT attempting to eject from a TV-2 pulled both armrests of the seat. The canopy fired. He then pulled what he thought was the trigger to eject, but the seat did not fire. Without further adó, he resorted to rolling the aircraft over and bailing out.

During the subsequent accident investigation, the pilot went through a dry run ejection in a TV-2 mock-up. After pulling the right armrest handle up, he gripped the lower portion of the trigger guard and pulled up and pushed down repeatedly. The seat did not fire because *he did not squeeze the trigger.*

The pilot himself stated that this was apparently what he had done in his extreme haste to leave his disabled plane. Describing his attempted ejection as a "one try only" situation, he reported that he had not even taken time to look at the trigger. He stated that he had in fact never before seen the trigger of this type of ejection seat or practiced the feel of it. In his seat checkouts, the right armrest had always been down, secured by safety pins, and the trigger had not been visible, he said.

If the trigger is squeezed *while* the armrest is being raised, the seat may not fire. If this occurs, the *TV-2 Flight Manual* states, release the trigger and squeeze it again.

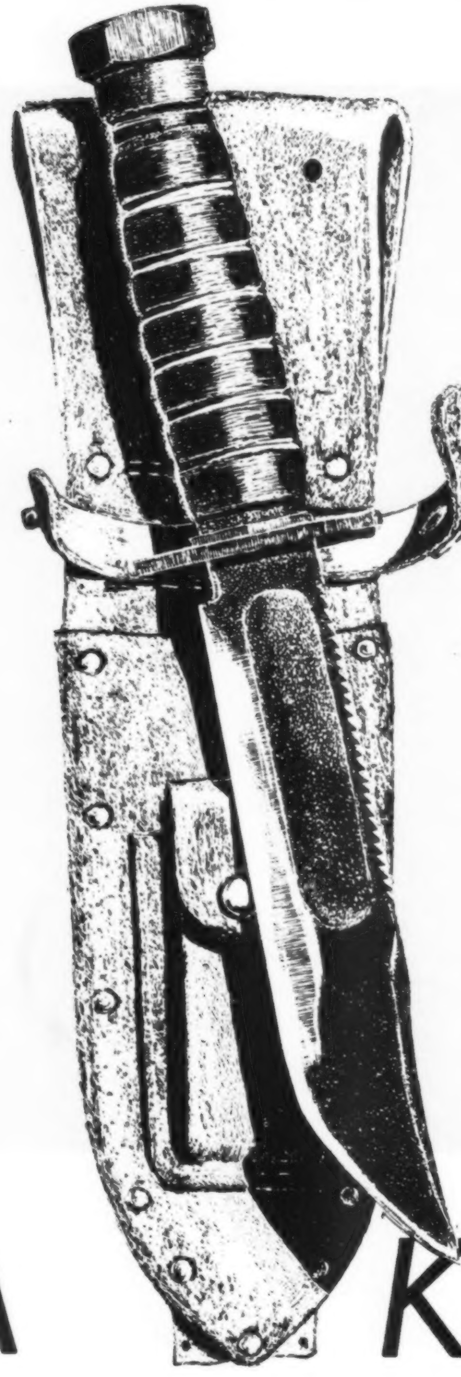
Hasty Preflight

ALTHOUGH the A4D now has a safety pin instead of a canopy bungee safety clamp the lesson of this fatal accident is still applicable. The safety pin is smaller than the safety clamp and, therefore, is even easier to miss on preflight check.

A pilot, later described by close friends and squadron mates as "preoccupied" with plans for leave and his impending release from active duty, made short work of preflighting his A4D. Both he and the plane captain overlooked a canopy bungee safety clamp which had been left installed in the aircraft.

Material failure caused a fire in flight making ejection mandatory. The pilot's attempts to eject failed; the aircraft crashed in a marsh and exploded on impact.

Accident investigators reached the following conclusions: The canopy had failed to jettison because the safety clamp was in place. Consequently, the seat had failed to fire. When the pilot actuated the manual canopy opening lever, the canopy opened but did not shear at the hinges. The seat still could not be fired because the canopy, although open, had not left the airplane. Post-accident investigation also disclosed that the pilot had pulled the ditching handle, perhaps in a further attempt to jettison the canopy or in an attempt to bail out over the side.



A KNIFE

A SURVIVAL knife can make the difference between life and death. Consider the following account of ejection and overwater descent after an explosion and inflight fire in an FJ3:

"I placed my feet in the stirrups and sat up as straight as possible. As the airspeed reached approximately 200 knots I reached for the curtain. Everything worked as advertised. The canopy blew off and much wind blast was felt. I ejected at about 22,000 feet. I started to tumble forward slowly at first and as I separated from the seat the tumbling became violent. I remembered to throw arms and legs out hard to stop the tumbling. As I did this I stopped tumbling and ended up in a flat spin rotating in a counter-clockwise direction on my back. The duration of the free fall is unknown but it felt like hours. At no point during the free fall was I able to judge the altitude.

"I decided that the automatic parachute release was inoperative so I started to reach for the D-ring which was out of its holder by a few inches. As my hand reached the ring the parachute popped automatically. The opening shock was much greater

than I had expected. After a few wild oscillations the parachute descent was very quiet and comforting. I inspected the canopy to see if all the panels were intact and they were. Also I checked to see if I was in one piece (I was) and I determined that all my survival gear was intact. I saw blood on my oxygen mask and life vest but thought it was from my nose due to explosive decompression. Besides there was no pain anywhere.

"After floating down for what seemed like an interminable period of time I decided to get into the seat strap which at this time was around the small of my back. After several attempts to get comfortable in the sling I gave up and thought I'd try at a lower altitude. Actually, I could get partially into the sling but never all the way. Toward the end of my descent, I thought there was at least 1000 feet between me and the water. This was an error for the next thing I knew I was in the water, completely strapped in.

"After the initial immersion, I bobbed to the surface and was immediately dragged on my back by the parachute which was completely filled with air. This took me completely by surprise and before anything could be done, I was a passenger being towed over some waves and under others. At this point I became quite distressed with the predicament as I was starting to take in water and began to choke.

"I decided to pull the toggles to inflate the life vest as more buoyancy was needed. This was an error for it merely made the chest straps tighter. I pulled the bottom shrouds instead of the top ones as I should have to deflate the chute. After some difficulty the leg straps were disconnected but the chest strap proved to be much more difficult. In fact it was impossible under the circumstances. Some panic set in at this time, I believe.

"I reached for my knife which was very accessible on the back of my right leg. I pulled myself up the risers and cut the top shroud lines. They parted easily due to tension. The canopy collapsed with no difficulty. For some unknown reason I decided to cut the bottom shroud lines as well. This left me completely free of the parachute but much debris was entangled between my legs making it difficult to float. A helicopter from the carrier was hovering over me at 5 to 10 feet and the wash from his blades was kicking a driving rain in my face. The helicopter left this position and I proceeded to pull the pararaft from its container as I couldn't find the toggle at the end of the lanyard. It was removed quite easily and I pulled the toggle to inflate the raft. Apparently I did not pull it far enough for the raft inflated only partially. After untangling whatever was around my legs, I pulled the toggle again and the raft inflated fully.

"Upon climbing into the raft I noticed the helicopter had dropped its crewman into the water to assist me. He swam over to the raft and got in with me until the helicopter got into position. We then got out of the raft and swam over to the helicopter rescue seat. The helicopter was quite low but we managed to get hold of the seat quite easily. The crewman who must have weighed approximately 185 lbs. and I with my 140 lbs. climbed onto the seat together and were hoisted very swiftly into the helicopter."

The survivor was uninjured except for a small cut on his chin where the chest buckle hit him as the parachute opened. ●

IN TIME!

FOD STILL NUMBER ONE!

by J.M. SMITH

Reliability Analyst
Naval Air Technical Services Facility

FOREIGN object damage still ranks as the number one enemy of the jet aircraft engine as evidenced by the large number of reports received with the cause of removal and damage due to the ingestion of unidentified foreign objects. In many cases these objects are found in the engine and identified either by the operating activity or by the overhaul activity on disassembly of the engine. When these *identified objects* are compiled into a listing, the identity of many items reveals numerous areas of inadequately supervised or non-supervised inspections and procedures. It is the intent of this article to review several of these items in an attempt to point up this unnecessary and wasteful damage to these costly engines and preclude possible personnel injury.

APPROACH has in the past published two listings of IDENTIFIED ITEMS (February 1959 and November 1959) that account for a total of 101 engines damaged during the period January 1958 thru July 1959. This damage amounted to an estimated repair bill of $721,500.00 which when added to the high number of engines damaged by unidentified objects amounts to an intolerable waste of funds.

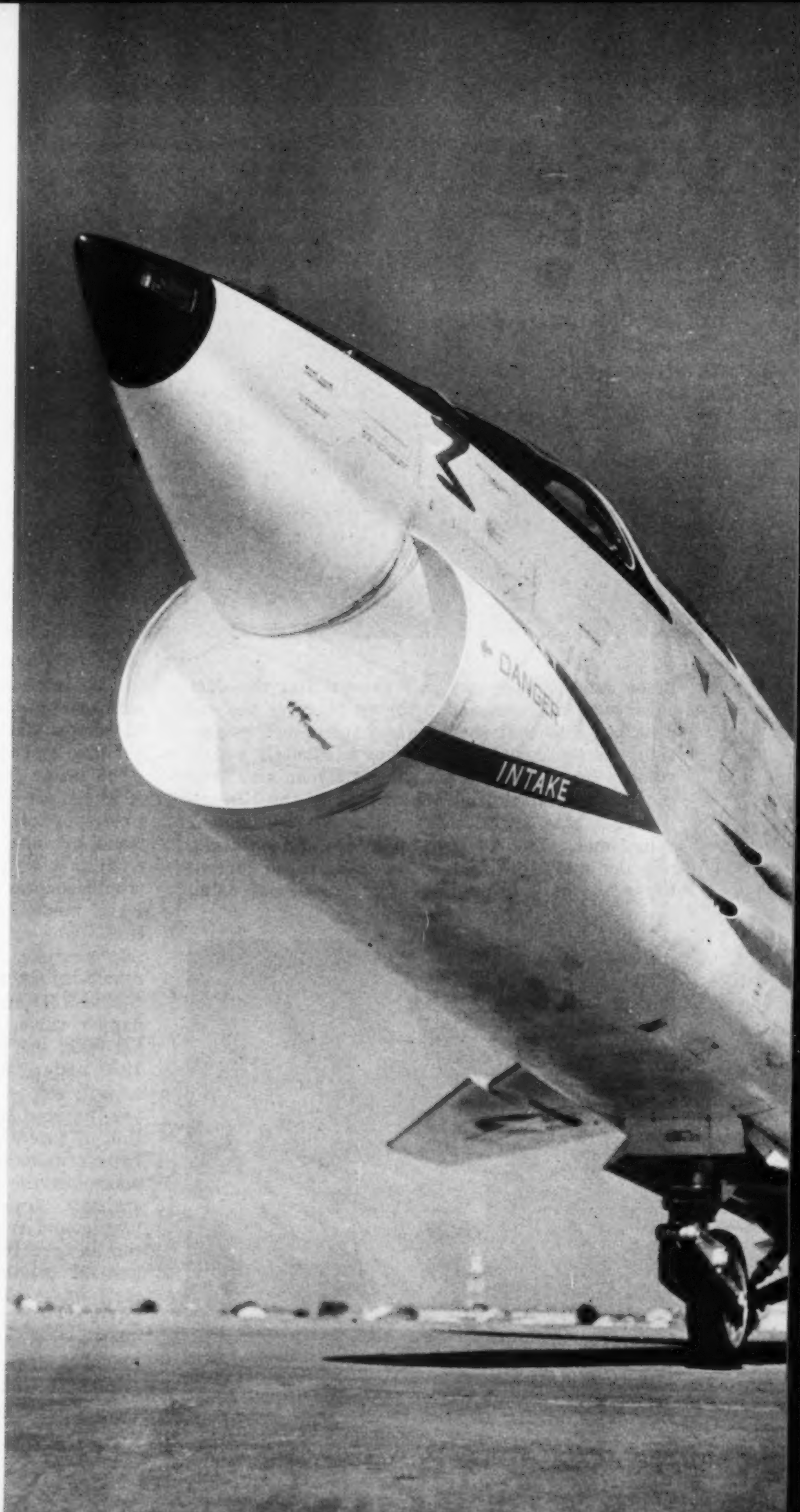
There have been many articles written, programs established and directives issued by all commands. If all were diligently enforced and supervised this tremendous waste of funds, involved man hours, and loss of aircraft for their intended purposes could and would be greatly reduced.

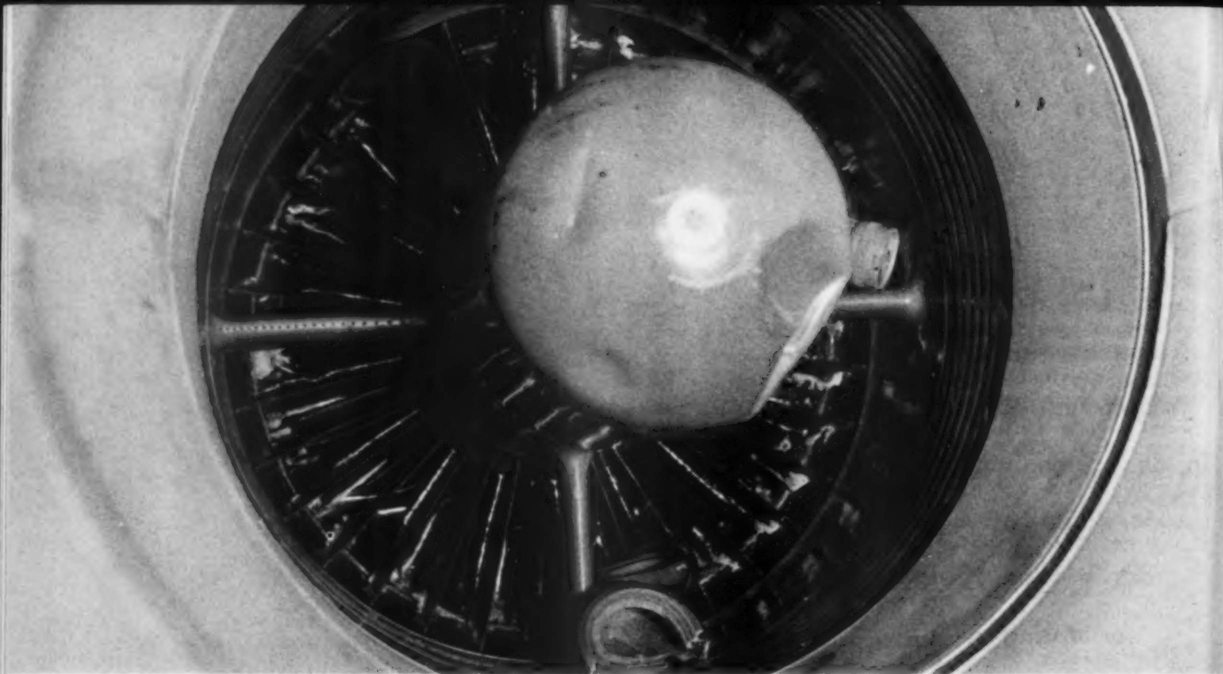
A summary of the IDENTIFIED OBJECTS that have been ingested by jet engines since July 1959 appears on page 50. A comparison of the two previous listings reveals the fact that many of the items appearing in this tabulation are "Repeaters." There were nine engines during the previous period damaged by the items that are intended to protect them, namely, the inlet duct cover and the engine run-up screen, indicating a lack of supervised preflight inspections. The duct cover on the two previous lists appeared seven times. Two canvas covers were being used as duct covers. On this listing the duct covers are running true to form and appear as repeater items

Both the postflight and the periodic inspections require inspection of the inside of the intake duct . . . for skin cracks . . . tears or distortions . . . loose or missing rivets and foreign material . . .

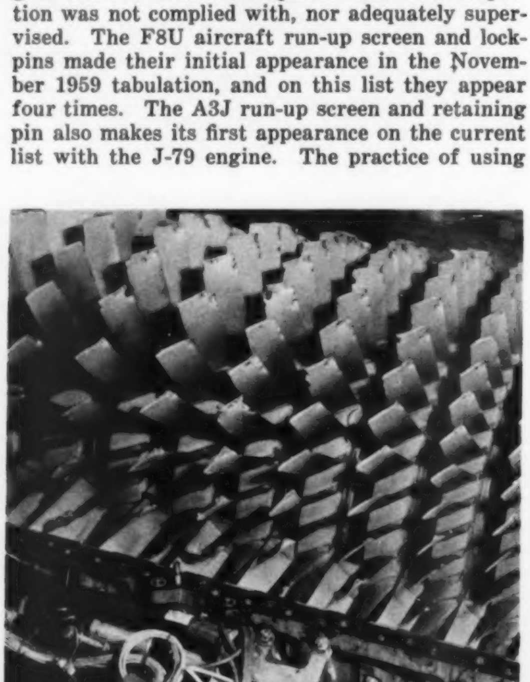
. . . To do this job correctly you must crawl down into the intake duct . . . you cannot do this inspection job right by simply chinning yourself on the intake duct edge and peeking in . . .

. . . This care makes a sure-fire "foreign object damage" preventive . . .





three times, which not only proves that the duct cover was not removed prior to starting the engine but also that the required inlet duct inspection was not complied with, nor adequately supervised. The F8U aircraft run-up screen and lock-pins made their initial appearance in the November 1959 tabulation, and on this list they appear four times. The A3J run-up screen and retaining pin also makes its first appearance on the current list with the J-79 engine. The practice of using



the air intake ducts for a temporary storage area while moving aircraft is evident by the ingestion of wooden blocks, plywood, wheel-chocks, parachute harness, and tie-down hooks and cable assemblies. (The latter item was taken from the November 1959 list on which it appeared three times). Articles of clothing and other personnel equipment items are also noted to be among the leaders including a wrist watch which was pulled from a troubleshooter's wrist while he was working on a F11F model aircraft—close to a personnel ingestion. One maintenance man was reported drawn into an inlet duct of an FJ-3M aircraft and the result injury is not known to this writer.

The F4D aircraft refrigeration system ram air flapper valve, Part No. 3542293, appears on this list twice and previously appeared in the February 1959 roster. After an inspection of all valves one activity reported four hinge failures with one being ingested into the engine. A very close inspection of this hinge is recommended to prevent any future damage to these engines. Radar access doors on the F3H aircraft are a very popular statistic, appearing once in the February 1959 listing and reappearing in this list twice indicating an area in need of a very close inspection for general condition and security of the latching mechanism. The special study—AIRCRAFT ACCIDENTS — INCIDENTS INVOLVING MAINTENANCE AND SERVICING published by the Naval Aviation Safety Center, in the F3H Airframe Section (Sect VI) cites two instances of failures and ingestion of this radar door.

In general if all personnel will adopt the "CAN DO" and "WILL DO" attitude this great waste of valuable funds, man hours, lost flying hours, aircraft availability and utilization can and will be greatly reduced. The directives and policies that are currently in effect are more than adequate and lack only the continued pursuance by, and wholehearted support of the personnel involved in the maintenance and servicing of aircraft to be effective. General good housekeeping practices, tool inventory, critical inspection of the aircraft parts and equipment in areas forward of the air intake ducts, and a meticulous inspection of the ducts and the turn-up area about the aircraft prior to starting the engine are positive steps to preclude damaging these engines. It is further recommended that all maintenance supervisors review the two previous referenced articles in APPROACH concerning IDENTIFIED FOREIGN OBJECTS, compare it with the current listing and take the necessary positive steps to correct the deficiencies in their locality and eliminate this intolerable and unsatisfactory condition. *(Continued on next page)*

Use a Checklist

If a tool or part is missing, keep in mind that *YOU* may be setting the scene for a major accident.

Make sure your inventory is accurate. If a shortage is noted, this should be reason for a thorough inspection of the aircraft on which the work was performed. Remember an airplane is most vulnerable to FOD after check—use a checklist as a doctor does. Keep a mental picture of tools used for certain jobs.

Keep the airplane clean. Use vacuum cleaners.

Are your procedures good enough? *Are they good enough?* All too often preflight and interim inspection sheets make no mention of the general cleanliness of an aircraft by various compartments. Even the latest series of inspection guides overlook this point. *Don't You Do It!*

FOD STILL NUMBER ONE!

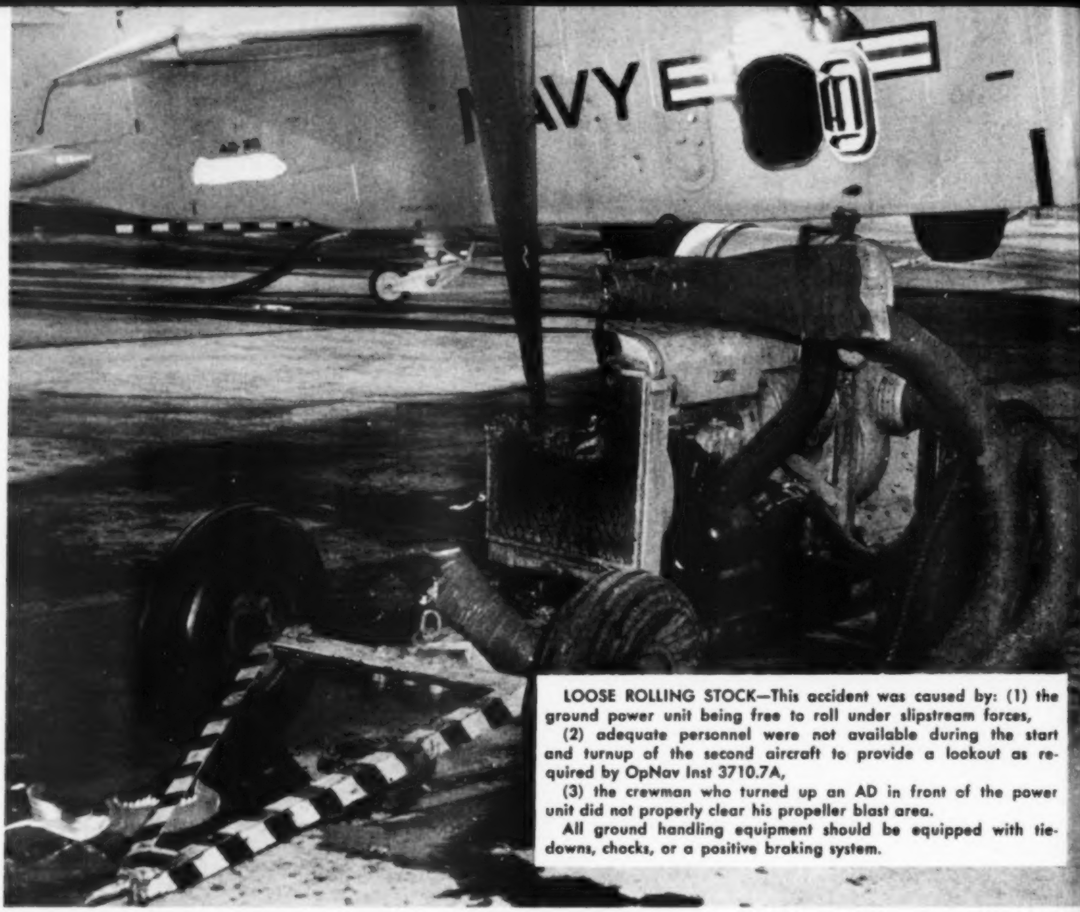
Case	Object	Engine	Aircraft	Time Since New/Ovhl
1.	Screw	J33 A 20	TV 2	532.0
2.	Screw PN 60709448	J33 A 20	TV 2	62.0
3.	Washer PN 6711969	J33 A 24	T2V1	193.0
4.	Paper-cloth	J33 A 20	TV 2	Unk
5.	Compressor bolt	J33 A 20	TV 2	239.0
6.	Washer	J33 A 20	TV 2	189.0
7.	⅜ bolt	J33 A 20	TV 2	59.0
8.	Safety wire	J33 A 24	T2V 1	181.0
9.	Air Adapter screw	J33 A 20	TV 2	149.0
10.	10/32 Screw	J33 A 20	TV 2	101.0
11.	Screw AN 501A10-12	J33 A 20	TV 2	395.0
12.	Bushing 671089	J33 A 24	T2V 1	86.0
13.	Washer AN 960-C146	J33 A 20	TV 2D	96.0
14.	Gunbay door	J34 WE 34	F2H	Unk
15.	Clevis pin	J34 WE 34	F2H	303.0
16.	Starter cover bracket	J34 WE 48	T2J 1	218.0
17.	10/32 bolt-nut	J34 WE 46	T2J 1	41.0
18.	10/32 screw	J34 WE 46	T2J 1	102.0
19.	Lock wire	J34 WE 34	P2V 5F	65.0
20.	Lockpin and flag	J34 WE 46	T2J 1	45.0
21.	Bolt	J48 P 8A	F9F	78.0
22.	7/16 wrench	J57 P 4	F8U 1P	Unk
23.	Flapper valve PN 3542293	J57 P 8	F4D 1	Unk
24.	Aluminum and rivets	J57 P 8A	F4D 1	Unk
25.	6" screwdriver—amber handle	J57 P 4A	F8U 1	94.0
26.	Pin—Intake screen CV 15-206107-30	J57 P 4	F8U 1	52.0
27.	Duct cover	J57 P 4	F8U 1	198.0
28.	Flight helmet	J57 P 8B	F4D 1	239.0
29.	Flapper Valve PN 3542293	J57 P 8	F4D 1	69.0
30.	Red cloth	J57 P 8	F4D 1	240.0
31.	Pin Screen CV 15-206107-30	J57 P 4A	F8U 1	266.0
32.	Baseball cap	J57 P 8	F4D 1	150.0
33.	Cotton rag/wrenching bolt	J57 P 4A	F8U 1	382.0
34.	Wash rag	J57 P 4A	F8U 1	118.0
35.	Screen run-up CV 15-206107-001	J57 P 4A	F8U 1	74.0
36.	Cloth	J57 P 4A	F8U 1P	88.0
37.	Aluminum	J57 P 8	F4D 1	13.0
38.	Can of sealer/wood block	J57 P 4	F8U 1	145.0
39.	Duct cover	J57 P 4A	F8U 1	225.0
40.	6" Aligning Tool	J57 P 8	F4D 1	268.0
41.	Plywood	J57 P 4A	F8U 1	252.0
42.	Denim cloth/cigarettes	J57 P 4A	F8U 1	92.0
43.	5/16 bolt	J57 P 8	F4D 1	135.0
44.	Sound attenuators	J57 P 10	A3D	Unk
45.	Wheel chock	J57 P 10	A3D	297.0
46.	Parachute harness	J57 P 10	A3D	264.0
47.	Fairing-Camlock-oil cooler	J57 P 10	A3D	282.0
48.	Camlock-oil cooler	J57 P 10	A3D	277.0
49.	Blue denim cap	J57 P 10	A3D	363.0
50.	7/16" open wrench	J57 P 6B	A3D 1	97.0
51.	Clothing	J57 P 10	A3D 2	196.0
52.	Rag	J57 P 10	A3D 2	46.0
53.	Nut-handle carbo blast unit	J57 P 10	A3D 2	446.0
54.	Run up screen and chain	J57 P 16	F8U 2	Unk
55.	Goggles	J57 P 16	F8U 2	Unk
56.	Tubing ⅜" x 3" 2 pcs.	J57 P 16	F8U 2	375.0
57.	Chamois	J57 P 16	F8U 2	165.0
58.	Nose Plug	J57 P 16	F8U 2	84.0
59.	Wrist Watch	J65 W 18	F11F 1	156.0
60.	Screw	J65 W 16	A4D	Unk
61.	Landing Gear Lockpin	J65 W 4B	A4D 2N	68.0
62.	Starter Washer	J65 W 4B	FJ3	4.0
63.	Duct Cover	J65 W 16A	A4D 2	271.0
64.	Cloth	J65 W 16A	A4D 2	103.0
65.	Cloth	J65 W 18A	F11F 1	30.0
66.	Awl	J65 W 16A	FJ 4B	250.0
67.	Nose Access Cover	J65 W 16A	A4D	Unk
68.	Cloth Streamer	J65 W 16A	FJ 3M	4.0
69.	Bolt ¼-25 x 3.75	J65 W 16A	FJ 4B	Unk
70.	Green Helmet	J65 W 16A	A4D 2	298.0
71.	Nose Plug	J65 W 16A	FJ 3M	11.0
72.	Canopy Parts	J65 W 16A	A4D 2	31.0

73. Canopy Lockpin and flag	J65 W 16A	A4D 2	10.0
74. Starboard gun plug	J65 W 16A	FJ 3	2.0
75. Sound Helmet	J65 W 18	F11F 1	151.0
76. Camlock	J65 W 18	F11F 1	56.0
77. Instrument Hood	J65 W 18	F11F 1	16.0
78. Compressor Case Eyebolt	J65 W 18	F11F 1	106.0
79. Starter Access Plate 98B1043-1	J65 W 18	F11F 1	0.0
80. 5/16" Open end wrench	J65	Unk	60.0
81. Marmon clamp from hose	J65 W 18	F11F 1	202.0
82. Rag	J65 W 4B	FJ 3M	250.0
83. Maintenance Man	J65 W 4B	FJ 3M	2.0
84. Rivets—Generator Cover	J65 W 4B	FJ 4B	233.0
85. Seat Safety Pin	J65 W 16A	A4D 1	200.0
86. Screw Driver from man falling from aircraft.	J65 W 4B	A4D 2	61.0
87. Radar Access Door	J71	F3H	Unk
88. Sound Helmet	J71 A 2E	F3H 2	Unk
89. 10/32 Washer	J71 A 2B	F3H 2	240.0
90. Seat safety pin and flag	J71 A 2E	F3H	84.0
91. Bolt 1.2 x ⅜"	J71 A 2B	F3H	101.0
92. Door number 22	J71	F3H	402.0*
93. Radar Door	J71 A 2E	F3H 2	2.0
94. Headset	J71 A 2B	F3H 2	89.0
95. Fairing	J71 A 2B	F3H 2	110.0
96. Zerk Fitting	J71 A 2B	F3H 2N	102.0
97. Refrigeration clamp 84-200M685	J71 A 2	F3H 2N	70.0
98. Aligning Bolt 5/16" x 17-5/16	J71 A 2B	F3H 2N	107.0
99. Rivets	J71 A 2B	F3H 2N	212.0
100. 3 pieces of metal and red washer	J71 A 2	F3H 2N	20.0
101. Machine screw	J71 A 2B	F3H 2N	109.0
102. 6/40 Machine screw	J71 A 2B	F3H 2N	100.0
103. Ear Muffs	J71 A 2	F3H 2	11.0
104. Screen retaining pin	J79 GE 2	A3J	Unk
105. Rivet	J79 GE 2	A3J 1	18.0
106. Bolt	J79 GE 2	F4H 1	41.0
107. Warning flag from inlet cover	T58 GE 6A	HSS-2	Unk

The estimated overhaul cost of these engines is as follows:

Engine Model	Number	Overhaul cost Per Engine	Total Cost
J33	13	$4500.00	$58,500.00
J34	7	4000.00	28,000.00
J48	1	6500.00	6,500.00
J57	37	8000.00	456,000.00
J65	28	7000.00	196,000.00
J71	17	9000.00	153,000.00
J79	3	Unknown	Unknown
T58	1	Unknown	Unknown
Totals	107		$898,000.00

Note: These figures do not reflect the true cost picture; Manhours spent removing, repairing, replacing and shipping these engines further increases overall maintenance costs beyond estimation.



LOOSE ROLLING STOCK—This accident was caused by: (1) the ground power unit being free to roll under slipstream forces,

(2) adequate personnel were not available during the start and turnup of the second aircraft to provide a lookout as required by OpNav Inst 3710.7A,

(3) the crewman who turned up an AD in front of the power unit did not properly clear his propeller blast area.

All ground handling equipment should be equipped with tiedowns, chocks, or a positive braking system.

SAFETY and RELIABILITY

Maintenance error is still with us and it appears that this area is one that offers a great potential for improvement. In acceptable maintenance procedures there is no room for haste, deviation from prescribed instructions, or lack of knowledge. With all the training and supervision that is expended, it is hard to believe that such things as lack of proper security, improper adjustments, and loose objects continue to plague the maintenance effort. Yet, these things are happening every day.

There is one way we can all help to decrease these problems, and that is to *know and use handbooks*. In doing any kind of a job we need:

A clean place to work

The proper tools

The appropriate instructions

The first two items need no explanation. However we can expand a little bit on the third item.

Realize that certain information is needed.

Know which handbook contains it.

Know how to find the information in the handbook.

Know and understand the instructions.

A Master Index

If there is a job to be done, more than likely there is some sort of an instruction to aid in accomplishing it. The problem can be intelligently attacked provided you *know where to look for the instruction.*

The best place to start is with the NAVAL AERONAUTIC PUBLICATIONS INDEX — NAVAER 00-500.

Just as there is an INSTRUCTION for practically everything; the Index is no exception. So, if you are hazy about using this book, READ THE INSTRUCTIONS FIRST. Remember too, this book is revised monthly and re-issued semi-annually, so be sure the one you're using is current.

EQUIPMENT MAINTENANCE—The recent loss of an NC-2 over the side of a carrier pointed up the need for effective equipment maintenance. The loss was attributed to a malfunctioning transmission gear system in the jeep. In this case it was necessary to use second gear to effect forward movement instead of low gear because the low gear train was defective. Repairs could not be made due to the lack of spare parts. Positive control of jeeps aboard carriers underway is difficult without defective controls.

How does your spare parts inventory stack up? —Getting parts at sea can be a real problem—stock up before you get underway.

SUCKED IN—The FJ-3M was in a high power turn-up. A mechanic crossed in front of the intake to get tools. After reaching a point slightly beyond the centerline of the intake, the hood of the mechanic's field jacket was seen to be sucked against the right side of the intake screen. The mechanic reached to retract his hood and instantly his jacket was drawn toward the intake pulling the mechanic against the screen. The lower right side of the screen was crushed and the mechanic entered the aircraft.

The main cause of this accident was the mechanic walking directly in front of the intake during a high power runup. However, the loose clothing worn by the mechanic made him susceptible to being drawn into the intake once he was in front of it. The intake screen was properly secured as designed, but it is noted that the screen was primarly intended to prevent foreign object

Ten Little Indians

When the ten little Indians became only nine little Indians, they could whoop and holler almost as loudly and fiercely as the original ten. But soon they became eight . . . and then seven . . . and somewhere along the line they became too few to whoop and holler loud enough to scare a herd of sheep.

And so it is with our equipment—any equipment, whether it be airplanes, mules, work stands or fire bottles. The direct cost of repairing a damaged item is not the only cost that is incurred. You may never know the additional cost in dollars, but anytime a piece of equipment is put out of service for repairs it *costs* something by being unavailable for service. You can get along pretty well with only nine mules instead of ten, let's say, because someone carelessly drove one off a pier—but the reason you had ten in the first place is because someone determined that you *needed* ten . . . and now you only have nine. If your nine little Indians became eight tomorrow, will you still get along just as well? How about when they get down to seven?

To illustrate with an example from the world of civil/private aviation, a jeep pickup wagon was accidentally backed into a corporate owned aircraft. The aircraft repairs cost $18,500. But—this wasn't the only item on the bill. The cost of leasing substitute aircraft during the time the damaged bird was laid up came to another $11,500—it *cost* someone (in the case, the insurance firm) to have the aircraft out of service. And an example from our own world—an NC-5 driver carelessly rammed an aircraft. He must have picked the sturdiest part of the plane, because it received no damage whatever. The NC-5 was damaged however, and was unavailable for several days while it underwent repair. The squadron still flew, despite the temporary loss of one of its little Indians. But *you* know and *we* know that the total cost was not just the repair bill . . . it *costs* to have equipment out of service.

damage to the engine by objects much smaller than a man.

The board commented that:

a. The major contributing factor in this accident was the lack of judgment on the part of the mechanic in walking in front of an operating jet engine.

b. When a discrepancy was found in the Jet-Cal unit, engine power was not reduced while it was being corrected.

c. A barrier is needed to prevent personnel from inadvertently walking in front of a jet engine turning up at high RPM.

d. Loose clothing is highly susceptible to being sucked into the low pressure, high velocity areas around jet intakes.

e. The present jet intake screen for the FJ-3 does not provide protection to prevent personnel from being sucked into the air intakes.

It was recommended that:

a. Jet intake screen be designed for the FJ-3 which will provide better security to the aircraft and a more rigid support for the screen.

b. All line personnel and mechanics working around operating jet aircraft be outfitted with a one piece overall type garment to be worn as an outer garment.

c. High Power Turn-up Areas be equipped with a portable barrier which may be positioned to prevent personnel from walking through the danger cone around jet intakes.

d. When any delay is encountered during a check involving jet engines that the engine power be reduced to idle or the engine shut down.

e. Continued emphasis be placed on briefing of maintenance and flight personnel to "give a wide berth" to the air intake of an operating jet engine.

—1st MAW "Wing Tips"

THERE'S ALWAYS A REASON—When the Aviation Safety Officer looks for a cause of an accident, he doesn't particularly concern himself with who was at fault, because he doesn't analyze accidents to place blame. It is his primary purpose to *prevent recurrence*, and to prevent someone from being injured. The reasons for the above record boil down to a general slackening off by maintenance personnel, as well as an apparent nonprofessional display on the part of pilots.—*NAS Alameda "Newsletter"*

LUMP THINKING—There is a wonderful way to conserve energy and escape the often arduous task of facing up to the problems that confront us. It has been termed "lump thinking." You do it by lumping things like accident causes into preselected categories that require no specific action. Categories like "carelessness" and "inattention" do very well. You can't be expected to do much about the joker who carelessly falls off a wing or absentmindedly wanders too close to the intake of a jet.

You can do it without an accident too. Why decide that a foreman needs instruction about a new hazard? You can save yourself trouble with a convenient classification. You can call him "uncooperative" or "not safety conscious."

Let us face the facts—all accidents are not necessarily the result of carelessness. While the human element is a considerable item of accident causa-

tion, the practice of attributing accidents entirely to carelessness is to throw a blanket alibi over the entire occurrence, thereby preventing any objective study of the causes, or the fixing of any responsibility for action to prevent recurrence. *—National Safety Council "Safety News Letter"*

HOT AIR CHECK—An F4D was on test flight after engine installation. Five minutes after takeoff the pilot experienced complete loss of AC generator. Afterburner lit off automatically. Engine RPM indicator became inoperative. Pilot reduced throttle and afterburner shut off. A successful precautionary landing was made without incident.

Cause:—The connection between bellows assembly and high pressure *manifold assembly was not adequately tightened during installation.* When the connection separated hot air (600° F and 167 psi) from 16th stage of engine compressor damaged nearby wiring.

Comments and recommendations of the Board: —After engine installation, the bellows assembly is connected through a fuselage access door. Although a torque value is stipulated for this connection, the limited access available precludes proper torquing. It is recommended, therefore, that the bellows assembly connections be drilled for lock-wiring.

Maintenance procedures are now modified to install the heat shield covering over the bellows assembly only after a ground run-up has been completed and a check for loose connections and escaping air has been made.

The necessity for thorough, complete work and exacting inspection procedures is apparent.*—from a FHIGA*

NO GO—ComFAir Alameda reported by Safety of Flight message that a steel bolt AN-3-12A was substituted for an aluminum shear bolt AN-3-13A in the A4D canopy emergency release system. A4D HMI AN 01-40AVA-2, revision dated 1 Jun 1959, page 2-28, figure 2-9, and also view (M) of an interim revision dated 6 Aug 1959 applies. It was further reported that canopy jettison and subsequent pilot ejection would be doubtful under the described condition. To detect occurrences of bolt substitution in the canopy emergency release arm the initiating command recommended a one time inspection of all A4D aircraft.

BuWepsRep El Segundo letter, serial 17447 dated 8 Jun 1960, to BuWeps commented on the submitted bolt problem described above and is

HSS/HUS Tail Rotor Assembly Balance

NUMEROUS discrepancies have been reported recently that are considered to be the result of improperly balanced tail rotor assemblies, i.e., tail rotor gear box input flange cracks and cracks in the pylon structure.

It has been determined that tail rotor assemblies can be satisfactorily balanced by proper utilization of the MARVEL balancing kit, FSN R4920-572-0987-S160. This kit has been evaluated afloat with satisfactory results up to and including sea state 4. Optimum results however will be obtained at a milder sea state or ashore.

It is strongly recommended that all operating activities insure all installed tail rotor assemblies are properly balanced. Out of balance conditions should be readily recognized by a "medium" frequency in-flight vibration.

Once the tail rotor assembly is properly balanced an out of balance condition should not occur during the entire operating interval. However, the possibility of moisture accumulation in the internal "honeycomb" structure of a blade may cause an out of balance condition of the assembly. If the blade and tail rotor assembly covers are properly utilized the possibility of moisture accumulation will be remote. If a "heavy" blade does develop that cannot be balanced within the assembly tolerances the blade should be replaced with a serviceable blade. The "heavy" blade is to be returned to the designated HSS/HUS overhaul point for correction of the discrepant condition.

A recent review of the operating history of commercial versions of the HSS/HUS helicopter, having in excess of 3000 airframe hours, indicated none of the aforementioned difficulties had been experienced. The MARVEL balancing kit had been used for tail rotor assembly balance throughout the total operation. — *BuWeps Spdltr FWAE-1432-LOA-15 20 April '60*

quoted below for information:

"Investigation has disclosed some aircraft have decal located in wrong position and some do not have arrow pointing to aluminum bolt. Contractor representatives report decals in service for a long time become obliterated and possible installation of steel bolt occurs when replacing canopy mechanism subsequent to inadvertent canopy opening.

"Action has been taken to revise IPB AN 01-40AVA-4, figure 18, to include AN3DD-13A aluminum bolt, revise decal marking in HMI AN 01-40AVA-2, figure 2-9 and revise view H-H, figure 2-16, shear bolt callout in HMI NavAer 01-40AVB-2-2 dated 1 Nov 1959. Above conditions could be factor in installation of steel bolt in lieu of AN3DD-13A aluminum bolt for canopy bungee emergency release arm. Recommend aircraft having decal minus arrow that arrow be stenciled on support adjacent to decal pointing to aluminum bolt and mutilated decals be replaced. Present decals are per Mil Specification. Concur with inspection criteria per basic messages and contractor will investigate metal decal installation on production aircraft and backfit if so directed by BuWeps."

"OIL-ADDED" REPORTING—Recently, a flight crew observed as indicated, high oil consumption on a transport engine. The yellow sheet showed 32 qts. added for each engine. How could 4 engines, all with different times, each use precisely 32 qts. of oil in a given period of time? It turned out, that the engine with the high indicated oil usage had a hole in the accessory case.

Accurate reporting of oil added would have given the crew, and maintenance people too, a little more insight about this engine, particularly since a puddle of oil had been observed on the pavement under the nacelle prior to departure.

When servicing piston engines with oil the exact number of *quarts added* to *each engine* should be entered on the report. This is the only method of computing abnormal oil consumption for an individual engine.

—*American Airlines "Maint. Letter"*

PROPELLER WEAR AND TEAR—"Orange Paint Disease," which can be defined as a symptom of serious hidden damage is a symptom that can never be overlooked. Frequently we very innocently create only the symptom of a damaged prop by merely rubbing a little orange paint from a piece of cowling, a wooden work stand or some other relatively harmless, painted object against the prop. But, nevertheless the observing main-

The Fine Line

"That maintenance personnel review all *discrepancies, including those that do not ground the aircraft, with the thought of catching small gripes before they become large and dangerous."—A.S.O. VMA-121*

This recommendation was included in a recent Flight Hazard report involving an A4D. The narrative went like this—"Pilot lined up for takeoff and performed pre-takeoff checks. All indications were normal. Pilot commenced takeoff. When airborne, at about 150 feet, he experienced loss of power. Pilot elected to abort. He reduced power to idle, landed the aircraft, dropped the hook and engaged the arresting gear."

The cause factor reported was insufficient tension on the throttle friction lock. The throttle linkage hung because it was rigged with excessive cushion in forward position.

The previous yellow sheet reported "Throttle friction little loose next pilot caution on take off (tighten up slightly)." Had this pilot taken heed of the yellow sheet write up, his takeoff would have been uneventful. Pilots are again briefed on the importance of thoroughly reviewing previous yellow sheets.

The following comments by a senior member of a local accident board are considered appropriate in this case and are offered for consideration.

All squadron doctrines should be modified to eliminate so-called "up-gripes," i.e., any discrepancy listed should automatically down the aircraft until action has been taken to correct the discrepancy and it is signed off by qualified maintenance personnel. Any pilot is qualified to list a discrepancy, but many of them are not qualified to make the decision whether or not the discrepancy listed should restrict the aircraft from further flight. Frequently a discrepancy listed will be resolved by the fact that the pilot doesn't know how to operate his equipment, which is in itself revealing and necessary information for further pilot training.

The decision to return the aircraft to an "up" status properly belongs to the maintenance officer and/or the operations officer. Normally, these officers are mature and fully qualified individuals who have knowledge of the equipment needed for the next flight and whether the discrepancy listed has any bearing on safety of flight and the mission of the next flight.

"Big accidents from small discrepancies grow!"—*El Toro AvSafBul*

tenance man not knowing the source of the paint must accept it as a possible clobbering blow from a tug, power unit or gas truck and have the prop changed for precautionary reasons.

Sometimes this "Orange Paint Disease" necessitates only touch-up work on the cowling.

The object of mentioning these situations is to forestall *needless* prop changes by, first, not backing into props with vehicles and, second, if it's just some paint smeared on the blades by the painter or a gob scuffed on by a ladder, removing it and not leaving it to create a prop change.

ROTOR BLAST—An aircraft was being turned up after completion of a 30-hour inspection. The port engine lower cowling had been removed for turn-up and was being held by maintenance personnel at a position forward and to the left of the port engine. As the engine was being shut down, a helicopter air taxied past the left side of the aircraft. Rotor wash blew the cowling from the mechanic's grasp and directly into the turning propeller of the port engine.

The high wind velocities developed by helicopter rotors can create a very hazardous condition when contacting loose gear, especially equipment having a large sail area. Every precaution must be taken to insure that such gear is secured while helicopters are being operated. It is often impossible for personnel to physically hold such equipment against the rotor blast.

It is recommended:

► That all loose equipment in areas where helicopters are being operated be moved to a safe distance or thoroughly secured.

► That extreme vigilance be exercised by all personnel against the possibility of hazards being created by high wind velocities developed by helicopter rotors.

SNIFF TEST!—The recent fueling incident at O'Hare where a recip transport was fueled with jet kerosene on one side has brought on a lot of suggestions, all remarkably alike. How about a sniff test? The flight engineer, as he checks fuel quantity in each tank, could check for any sign of kerosene odor. This might well be a very worthwhile precaution, especially at stops handling jet fuel. This isn't a sure test, of course, since individual tolerance to odors varies considerably and is affected by such things as colds, smoking.

Also, a mixture of 145 octane fuel, which is light purple in color, and 115 octane fuel, which is light green in color produces the appearance of a white fuel, which can be easily mistaken for jet fuel. The "sniff" test could serve as preliminary check here, too.—*TWA "Flite Facts"*

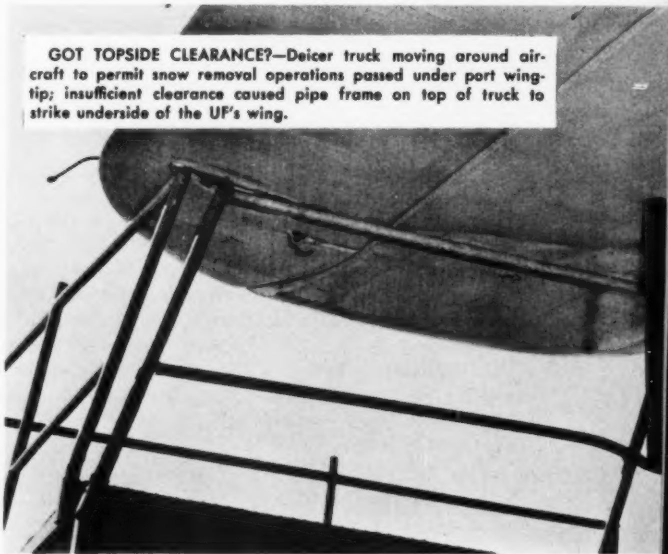
GASKET MARKING—A P2V-5F was on a local training flight at an overseas base. Approximately one hour after takeoff, the pilot noticed an excessive amount of oil flowing from the port engine breather lines. This engine, an R3350-36W, was relatively new, having a total of 63 hours. The decision was made to feather the engine and return to base, and an uneventful landing was made at home base.

Upon inspection of the engine, it was noted that the oil coming out of the breathers was actually a mixture of anti-detonation injection (ADI) fluid and oil. The water injection system was inspected and it was discovered that the power control valve mounting gaskets were installed incorrectly (backwards). (Gasket part no. 131166B water injection fluid metering valve body adapter screen and Gasket part no. 130324B—water injection power control unit spacer.)

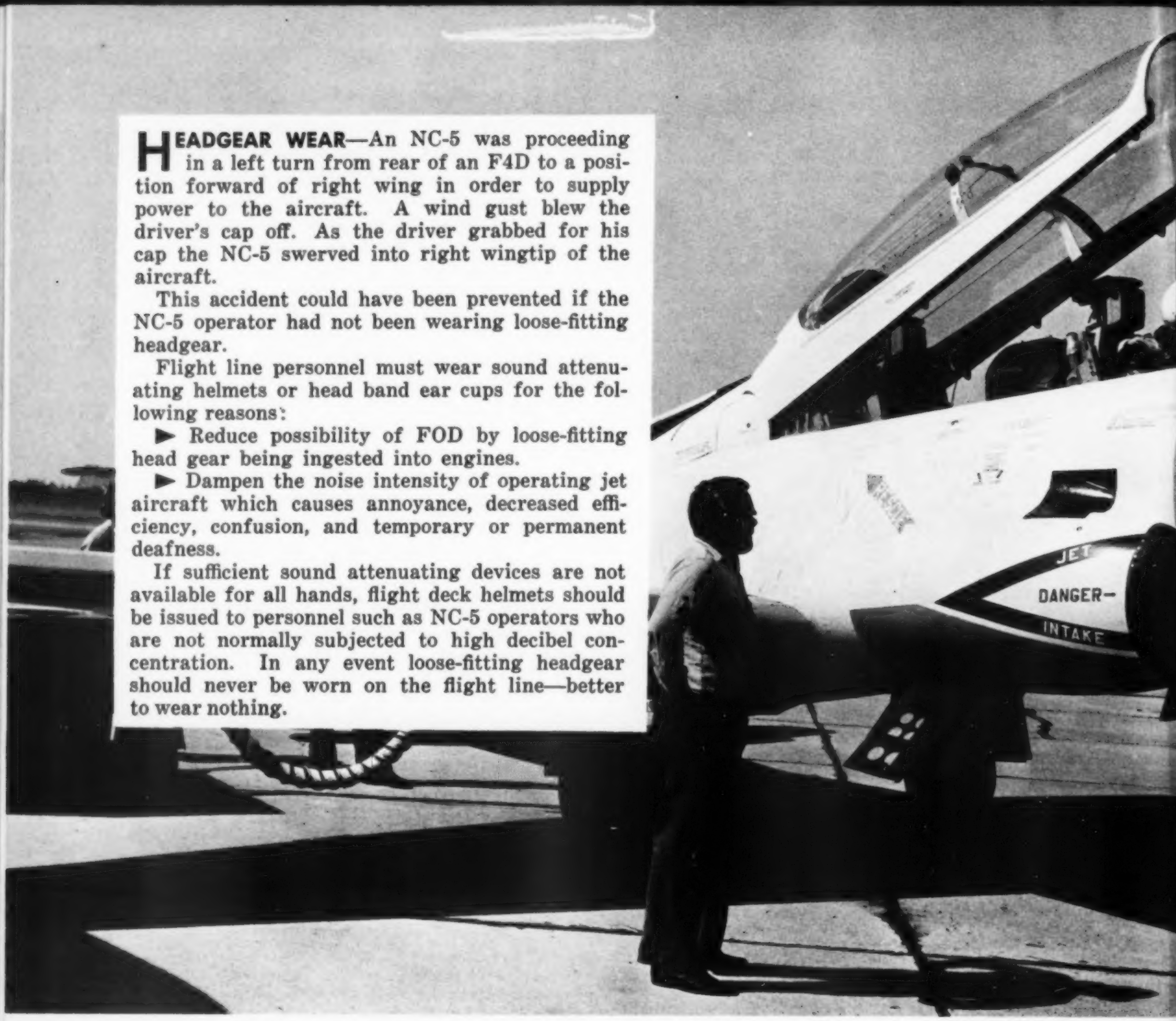
This resulted in the ADI fluid being channeled into the oil system causing the oil to foam and flow from the breathers.

This incident could have been easily avoided if proper care and more rigid adherence to service instructions were observed at the time of the engine change.

Such incidents could be prevented in the future by markings on the gasket to indicate which is the front and back.—*Anymouse*



GOT TOPSIDE CLEARANCE?—Deicer truck moving around aircraft to permit snow removal operations passed under port wingtip; insufficient clearance caused pipe frame on top of truck to strike underside of the UF's wing.



HEADGEAR WEAR—An NC-5 was proceeding in a left turn from rear of an F4D to a position forward of right wing in order to supply power to the aircraft. A wind gust blew the driver's cap off. As the driver grabbed for his cap the NC-5 swerved into right wingtip of the aircraft.

This accident could have been prevented if the NC-5 operator had not been wearing loose-fitting headgear.

Flight line personnel must wear sound attenuating helmets or head band ear cups for the following reasons:

- ► Reduce possibility of FOD by loose-fitting head gear being ingested into engines.
- ► Dampen the noise intensity of operating jet aircraft which causes annoyance, decreased efficiency, confusion, and temporary or permanent deafness.

If sufficient sound attenuating devices are not available for all hands, flight deck helmets should be issued to personnel such as NC-5 operators who are not normally subjected to high decibel concentration. In any event loose-fitting headgear should never be worn on the flight line—better to wear nothing.

OIL SAMPLING FROM CRASHED AIRCRAFT—Obtain a gallon sample from the engine oil system and one gallon of the new oil serviced to the engine. By having both samples we can tell if the oil in the engine was up to specifications prior to servicing or if it had deteriorated as a result of internal failure with its accompanying heat, metal particles and so on. It is usually very difficult (even impossible) to tell if the oil was at fault in cases where there is internal engine failure. In some cases a great amount of heat is often generated which decomposes the oil and many metal particles from the failure are present. The problem is to determine which preceded the other: Did bad oil cause the failure or did the failure cause the oil to be bad?

On multi-engine aircraft where just one of the engines has suffered an internal failure, it would be very wise to send in a sample of the oil from one of the engines that *didn't* fail, as very likely all were serviced from the same oil.

It is accordingly important that the details of the crash be supplied too, that is, was there an internal engine failure; was the engine exposed to heat and fire? These conditions have a great effect on oil too. The environmental factors affecting the oil must be separated from the inherent deficiencies of the oil. The more history that is supplied the more intelligently can we determine what type of analysis should be made and findings interpreted. Any circumstances bearing on the failure or crash that may guide the investigation of the oil should be reported.—*Quantico Skyhook*

ANALYZING OIL—An oil analyzation program being conducted by O&R, NAS Pensacola. There have been 7 engines changed to date due to the results of the oil analysis. The DIRs of the first 4 engines changed each revealed engine damage which would have caused engine failure at some later date. Right now, oil samples are being sent in when the strainers are pulled on all reciprocating engines except the T-34. It is expected that some engines may be changed prematurely but the laboratory has not yet built up sufficient data so as to be able to tell exactly how long an engine can safely be operated when contamination first shows.

This program of oil analysis is not confined to the training command. Selected AD squadrons in the fleets are trying out the program at this time and, at some future date, probably all jet and reciprocating aircraft in the Navy will be included in the program.—*NABaTraCom*

OF SPACE AND MEN—Spotting two aircraft on the No. 3 elevator allows the maximum number topside in a safe position while landings are in progress. This utilization of topside deck space makes it possible to start planes early and feed them into the landing pattern as low state aircraft are dropped down No. 1 elevator for refueling. It is recognized, however, that a greater demand is made upon the handling crew when spotting in this manner.—*from accident report USS* BON HOMME RICHARD

SPARK PLUG TROUBLE—Two minutes after takeoff, aircraft at 500 feet, 80 knots TAS, straight climb, pilot reported unusual engine noise and a loss of power. He announced his intentions to land on a nearby golf course and stated that he suspected a blown spark plug. Commencing an autorotation with engine at idle RPM, he experi-

ALMOST— BUT NOT QUITE...

Mechanics, perhaps more than any of the other types, know necessity is the mother of invention. Here's a real heart breaker to a chief who in doing a good job to keep 'em flying saw his efforts fall short.

FOLLOWING an afterburner section takeoff in an F8U-1 the pilot transitioned to the clean configuration. The two-position wing was locked down; however, the leading edge droops did not retract. This was unnoticed by the pilot at this time.

Following wing actuation the pilot experienced an unusual trim pitch condition in the form of an excessive nose-up trim requirement. While attempting to fly into position the pilot retracted the cruise droop and two seconds later heard a loud noise and felt a sudden yaw. Shortly after this the pilot noticed that the center section leading edge droops were torn away and the outboard droops were down. The droops struck the fuselage, punctured the main fuel cell and damaged the UHT. The fuel being siphoned from the ruptured tank was touched off by the afterburner flame, and the aircraft appeared to be engulfed in flame. When the afterburner was terminated the fire went out.

The pilot dumped wing fuel and made a wing-down landing. The hook shoe separated on contact with the abort gear due to being weakened while dragging on the runway. Aerodynamic and normal braking were used and the pilot turned off at the end of the runway.

The cylinder was disassembled and the *two* O-ring neoprene seals were found in a mutilated condition. The IPB lists *one* O-ring neoprene and *two* teflon back-up seals for the piston end. Two months prior to this accident squadron maintenance disassembled the cylinder and installed two neoprene O-ring seals instead of *one* O-ring and two teflon seals. At this time a replacement cylinder was ordered AOCP. The cylinder was not available in the area. The CPO made a decision, due to delay in procurement of the cylinder, to disassemble and repair the cylinder. Replacement seals were ordered and were unavailable in the area. The CPO, knowingly, made the substitution of two O-ring seals. The droop functioned properly during 40.6 hours prior to the accident.

With the advent of the present day high-performance, highly complex aircraft, strict adherence to proper maintenance procedures is a must. No longer can substitute materials and short cuts be tolerated.

enced a complete loss of engine power in flare, and landed without further incident.

The external metal portion of a spark plug is made in two separate parts. The bottom portion that screws in cylinder and the upper portion that receives the high tension lead. These two portions are joined together by crimping. This spark plug failed at this crimped joint and separated blowing out the internal ceramic insulator. Possibility exists that the spark plug lead retaining nut was tightened excessively when installed and loosened this crimped joint.

This incident reemphasizes the need for proper spark plug installation.

CHIPPING PAINT— During normal sump and strainer checks the presence of paint chips in the oil system was detected in an AD-6. Investigation revealed that the cans utilized in replenishing the oil system were painted yellow. This paint had also been extended to the can spouts and was being chipped from the spouts when inserted in the filler neck of the oil tank.

Comments and Recommendations of the Board: It is realized that all carriers of the U. S. Navy attempt to look shipshape by presenting a clean and neat appearance, even to the point of painting oil replenishment cans. However, since squadrons operating reciprocating engine type aircraft are having enough problems with other foreign materials in the oil system, it is recommended that this painting be restricted to the body of the can only and that sections of aircraft oil hoses be attached to the spout to prevent paint from chipping off and falling into the tank.

It is further recommended that this information be passed on to all ships operating with reciprocating engine aircraft.

Windshield Wiper Operation Check

"Windshields become seriously damaged when the blades are operated on dry glass. Polishing out the scarred surface is almost impossible. The panel has to be removed from the aircraft to refinish the marred surface.

"The correct procedure for checking wiper operation is to slip a piece of smooth tough wrapping paper under the blade. When checking for a clean sweep, use plenty of water—keep the glass wet."—*FSF, Inc. "Mechanic's Bulletin."*

SHOP NOTES: —*Coarse Threads . . . Fine Threads . . . WHICH ONE? . . . WHEN?—What's the difference?*

Coarse threads conform to Unified National Coarse (UNC) standards while fine threads are governed by precise, detailed specifications for all thread dimensions and proportions.

UNF standards specify substantially more threads per inch. The following table illustrates the range of difference in various diameters.

Diameter of Fastener	UNC Threads Per Inch	UNF Threads Per Inch
¼"	20	28
⅜"	16	24
½"	13	20
¾"	10	16

Coarse thread advantages

For the great majority of applications, fasteners with coarse threads are used because of these advantages:

1. They assemble easier and faster . . . provide a better start with less chance of cross threading.
2. Nicks and burrs from mass handling are less liable to affect assembly.
3. More clearance provided for plating.
4. Less liable to seize in temperature applications and in joints where corrosion will form.
5. For threading into lower strength materials, coarse threads are less prone to strip.
6. Extreme difficulties are encountered in attempting to tap fine threads in brittle or friable material.

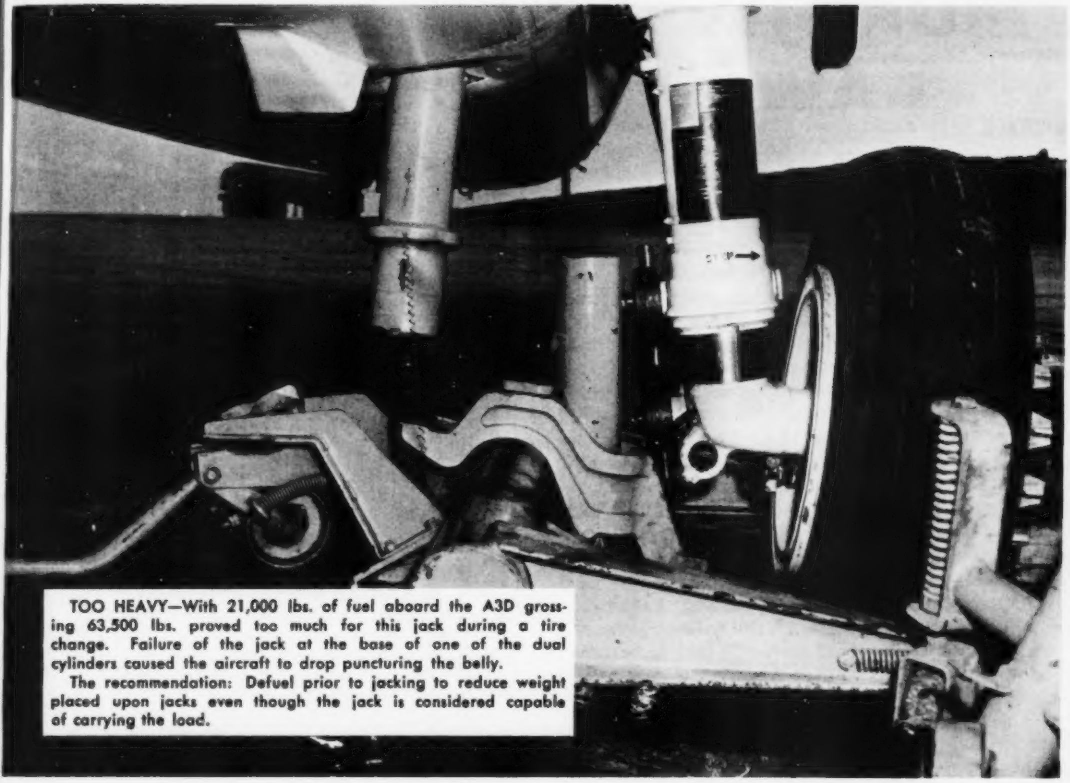
Fine thread advantages

In some applications, fine threads provide a superior solution because of these advantages:

1. They are some 11 percent stronger than coarse threads due to greater cross-sectional area.
2. In very hard materials, fine threads are easier to tap.
3. They have better fatigue life than coarse threads.
4. They can be adjusted more precisely when a cotter key is used.
5. Where the length of engagement is limited, where a smaller lead angle is required, or where the wall thickness requires a smaller thread, fine threads should be used.—*Design News*

GROUNDING AND BONDING—When you say "I put on my shoes and socks" no one would expect to find that you had put your shoes on first.

In other operations, however, proper sequence is not so obvious; and yet, failure to follow it can



TOO HEAVY—With 21,000 lbs. of fuel aboard the A3D grossing 63,500 lbs. proved too much for this jack during a tire change. Failure of the jack at the base of one of the dual cylinders caused the aircraft to drop puncturing the belly.
The recommendation: Defuel prior to jacking to reduce weight placed upon jacks even though the jack is considered capable of carrying the load.

have disastrous results. An example, is in overwing fueling and the bonding connection at the nozzle to the aircraft is not made until *after* nozzle is stuffed into the fill pipe.

Bonding the nozzle is to prevent "fireworks" when the nozzle first contacts the tank opening. *Remember—Before* fueling:

1. Ground aircraft and dispensing unit.
2. Connect a bonding cable from the fuel dispensing unit to the aircraft.
3. Attach hose nozzle bonding cable to aircraft *before filler cap is removed* and maintain this bond until filler cap has been closed.—*AA Weekly Maintenance Letter*

BLADE FOLDING TROUBLE—An HSS-1 was parked on the flight deck near spot seven. The folding crew was directed to fold blades in order that the aircraft could be struck below. During the folding evolution, as the forward starboard blade was being lowered to the hands of the deck crew, positive control of the blade travel was lost and the blade was carried well aft of the vertical lowering plane causing "Charlie" damage to the rotor head component of the aircraft. The aircraft was later transferred to O & R for induction into overhaul.

The crew had experienced considerable difficulty in folding the aft starboard blade due to wind conditions, and this prompted the blade folding crew leader to vary from the standard folding procedure (leaving locking horn engaged) in an attempt to exercise more positive control over the blade as it was being lowered. Damage to the rotor head was a direct result of the sleeve not being free to rotate on the spindle when the blade drifted aft from the wind sail effect acting on the blade.

It is recommended:

► That blade folding crews adhere to the prescribed procedures contained in the HMI, and that any deviations therefrom, regardless of the circumstances must be directly authorized by competent authority.

► That blade folding crews encountering difficulty during folding of rotor blades immediately advise the flight deck officer. ●

MURPHY'S LAW*

R7V-1

WHILE cruising at 10,000 feet on an overwater flight, a pilot flying a R7V-1 type aircraft experienced a complete loss of hydraulic pressure and fluid. The No. 4 hydraulic pump pressure warning light came ON and at the same time the secondary system quantity gage of the main hydraulic reservoir indicated a loss of fluid. No. 4 pump was secured, but the secondary side continued to show a loss of fluid. The No. 3 hydraulic pump was then secured. The secondary system now indicated empty and the primary system hydraulic fluid was observed to be decreasing. Boost-off operation was initiated and the No. 1 and No. 2 hydraulic pumps secured. At this time the primary system quantity gage of the hydraulic reservoir indicated approximately ⅛ full.

With all pressure off the hydraulic system an attempt was made to replenish the hydraulic reservoir. The hydraulic fluid which should have gone to the primary side, went instead to the secondary system side of the hydraulic reservoir. When any hydraulic pump was returned to the line, an immediate drop in pressure and loss of fluid was experienced.

Investigation revealed a broken hydraulic line between the No. 1 hydraulic pump control valve and the main hydraulic reservoir. This would cause a loss of pressure of the primary system as well as a loss of fluid on the primary side of the main hydraulic reservoir but should not affect the secondary hydraulic system. Further investigation revealed the lines leading from the aspirator return by-pass valve to the main hydraulic reservoir were connected improperly.

Mechanics, making an aircraft service change that modified the hydraulic system from an automatic crossover to a manual crossover system, failed to complete the modification. While making the aircraft service change at the outlet side of the aspirator return bypass valve they failed to change the lines (Murphy's Law) so that the secondary system return fluid would return to the secondary side of the main reservoir. Failure to change these lines permitted secondary aspirator return hydraulic fluid to supply fluid to the faulty primary system.—*Contributed by LCDR. A. E. Pearsall, VR-7*

* If an aircraft part can be installed incorrectly, someone will install it that way!

HSS-1

UPON entering the HSS-1's cockpit and while performing the check-off prior to starting the engine, we were checking the flight controls for freedom of movement. The "collective" did not respond to normal control movement and upon investigation I found that the inertial reel control locking cable was installed improperly, (MURPHY'S LAW). The cable passed over the weld assembly rather than over the collective and under the weld assembly. This prevented free use of collective movement and would have allowed only limited flight control had we attempted to takeoff.

This aircraft was turned up the day before for check after coming out of major check.—*Anymouse*

AD

DURING intermediate inspection the airframes mechanic noted a stiff operating condition existing in the elevator trim tab movement of an AD. Upon disassembly, corrosion was found in the shaft, universal and jackscrew assemblies. Replacement of the affected parts was made. Upon reinstallation of the above assemblies the drum assembly was mounted and the cables then rigged from the bellcrank to the drums. Because of the scanty instructions and somewhat misleading drawings supplied in the HMI and the IPB, the airframes mechanic rigged the cable to the drums so that the drums rotated opposite to normal. An operational check was completed after installation to ensure that both elevator tabs moved in the same direction as prescribed. The direction of movement, although being the same for both elevator tabs, was actually wrong aerodynamically. This condition went unnoticed by the mechanic involved.

On takeoff a definite nose-down trim condition was experienced upon reaching flying speed. Considerable back pressure on the stick enabled the pilot to become airborne. An emergency was declared and the pilot landed safely.—*Quantico "Sky Hook"*

F9F-8T

MURPHY does it again! An F9F-8T, recently received from an overseas activity, was in the process of being drop-checked and prepared for ferry flight when it was noted that the port wheel would not fully retract, and that chafing of the port wheel well hydraulic lines was occurring. Investigation revealed the port main landing gear tire was at fault. Whereas a 25 x 6.0, 14-16 ply tire should have been installed, a 26 x 6.0 10-ply tire had been substituted. This latter type is normally found on the nose wheel of an R4Y aircraft. Although the 26 x 6.0 tire does fit the wheel of an F9F-8T, it is an inch larger in diameter and when properly inflated will not completely house in the wheel well without chafing.

Fortunately this incident did not result in aircraft damage, but Naval Air Station, Alameda, maintenance personnel learned a valuable object lesson which may prevent a recurrence of this type "Murphy." Nevertheless, if it can happen once, it can happen again somewhere, and it is only through increased publicity of such incidents, with appropriate cautions to all maintenance and supply personnel, that incidents of this nature can be minimized. The exact and proper tire should always be used. The old advertising cliche —"Accept No Substitutes," is still a good slogan and is applicable in all phases of aircraft maintenance.—*Contributed by CO, NAS Alameda*

S2F-2

AFTER installation of a new landing gear timer check valve assembly, part no. 159-480-3, on each main landing gear of an S2F-2, the gear was raised to test the operation of the newly installed part. Upon raising the landing gear, the starboard main gear doors closed prior to the gear entering the wheel well. Observers outside the aircraft warned the man in the cockpit to drop the gear, and the hydraulic jenny was secured; but it was too late to prevent damage to the gear doors. Both starboard main gear doors had to be replaced.

Maintenance personnel installed the starboard landing gear timer check valve backwards. The port landing gear timer check valve was removed by one mechanic. The starboard timer check valve was removed by a second mechanic. Both new timer check valves were installed by a third mechanic. Both timer check valves are interchangeable except that the starboard valve is installed 180° from the port valve. This was not done.

It is recommended that whenever a person starts a job of this nature that he finish it.

It is also recommended that all maintenance work upon its completion be meticulously inspected. This is another case of Murphy's Law that can be avoided by proper inspection of work. Since these parts are interchangeable, attention to minute detail is imperative.—*from a FHICA*

CLIPBOARD

Minor Illnesses

THE common cold, digestive upsets, and other minor illnesses, which do not seriously handicap individuals in other pursuits, may produce intolerable impairments in flying personnel. Inflammation accompanying a cold can cause extreme discomfort during altitude changes and painful, distracting injury to the ears and sinuses may result. Distention caused by gas in the stomach or intestines may give rise to symptoms varying in intensity from mild discomfort to incapacitating pain.

There should be a general awareness of the fact that flying renders seemingly minor conditions, described as feeling "poorly," "not up to par," "bushed," "under the weather," and the like potentially most hazardous. Flights should not be undertaken when there is any question regarding the fitness of the individual pilot or aircrewman.
—OpNavInst 3740.7, 25 June 57

Reporting Local Visibility

SINCE air traffic control problems change considerably when shift of VFR to IFR weather conditions occur, in the future, designated FAA control tower personnel will take over the observation and reporting of visibility when the ground visibility is less than four miles. It is believed that this change will improve ATC operations in the terminal area, since controller personnel will be alerted as visibility drops toward the three mile IFR requirement.—*TWA Flite Facts*

SAR "Bible" Available

Atlantic Air Stations have recently received the Search and Rescue Plan for the Atlantic Maritime SAR region which establishes operations procedures to be used by Coast Guard and other Armed Forces units.

Though much of the material refers to command relationships and much is in general terms, squadron personnel may be interested in some of the specifics related to aviation matters.

Distribution of the Search and Rescue Plan for the Atlantic Maritime SAR Region and an 85-page "handout" booklet summarizing presentations at the 4th Annual SAR Seminar conducted in May by the Norfolk SAR Coordinator (Commander, 5th CG District), will bring much valuable information to units throughout.

Stations operations might review the Atlantic SAR Plan keeping in mind the possibility of using it as a model for local SAR manuals. The Atlantic SAR Plan should be "must read" material for Operations personnel. In the manual: Concept of Operations, SAR Mission Coordinators Check-Off List for Uncertainty Phase, SAR Areas, Communications, SAR Facilities, Emergency and Survival Equipment of International Aircraft, Atlantic Merchant Vessel Reporting (AMVER System), SAR Agreements, Ocean Station Vessels, and Policies.

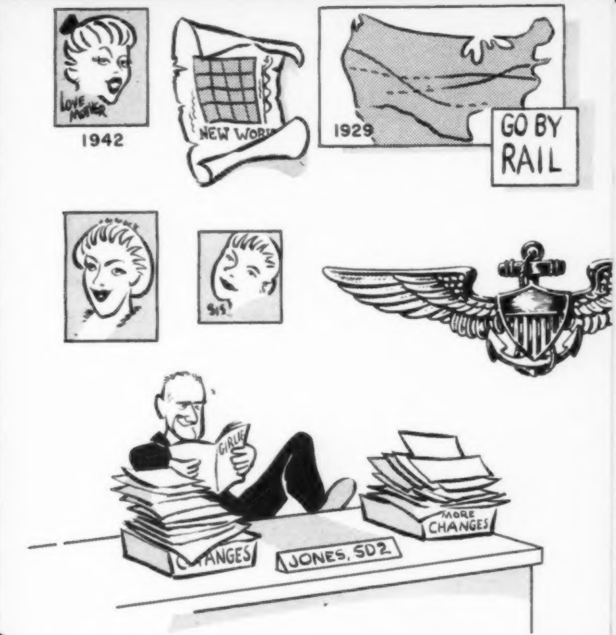
The Atlantic SAR Plan is "Annex Delta" of Coast Guard Eastern Area Operation Plan No. 1-60, and supports the National SAR Plan, the National SAR Manual, the CG Commandant's directives on search and rescue, and the various SAR Agreements between Coast Guard and other Armed Forces and agencies. The task organization includes Armed Forces commands and other Federal agencies with a search and rescue potential and located in the general area of the Atlantic SAR Maritime Region.

The booklet distributed to representatives at the 4th Annual Search and Rescue Seminar covers the National SAR Manual in an informal and easy-to-read manner; and should be a valuable addition to training aids for those "new" to Search and Rescue, as well as a good refresher to all others.

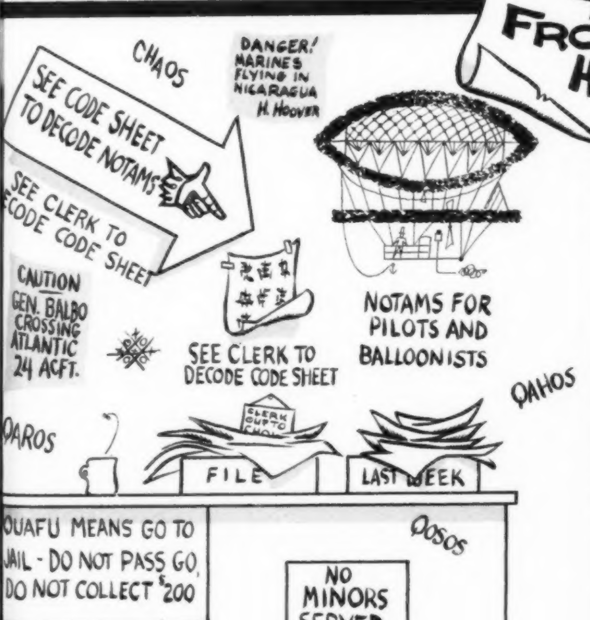
Those interested may obtain a copy of the Atlantic SAR Plan by writing to Commander Eastern Area, U. S. Coast Guard, Customs House, New York 4, N. Y. The SAR seminar booklet is available from Commander 5th CG District, P.O. Box 540, Norfolk 2, Va., Attn: Navy Liaison Officer. These booklets are in very limited supply and requests should be held to one copy per unit.

LIGHT PLANNING SECTION SHALL BE LOCATED--- ONVENIENT TO FLIGHT CLEARANCE DESK and WEATHER FFICE – THE LOCATION SHALL BE CLEARLY INDI- ATED TO GUIDE TRANSIENT AIRCREWS."

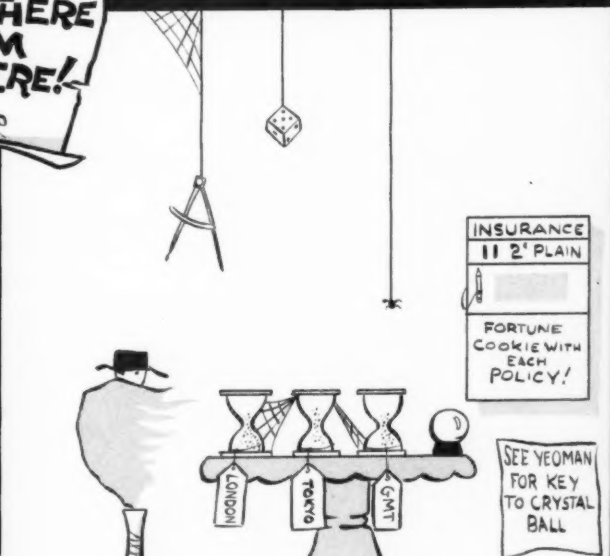
OPNAVINST 5604.2A



"FLIGHT PLANNING SECTION SHALL BE--- MANNED THROUGHOUT WORKING HOURS BY PERSONNEL QUALIFIED TO MAINTAIN FIP and ASSOCIATED WALL DISPLAYS."



"NOTAMS, DECODED TO PLAIN LANGUAGE and CONVENIENTLY POSTED SHALL BE MAINTAINED UP-TO-DATE FOR READY REFERENCE."



"THE FOLLOWING NAVIGATIONAL EQUIPMENT SHALL BE AVAILABLE:

PLOTTING INSTRUMENTS, FLIGHT COMPUTERS, CLOCK INDICATING GREENWICH MERIDAN TIME."